EPBC 2017/8094

2023 Annual Compliance Report

Yalyalup Mineral Sands Project

15 November 2022 to 14 November 2023

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Report and Scope

The Yalyalup Mineral Sands Project (EPBC 2017/8094) was declared a controlled action as per the EPBC Act 1999 on 8th February 2018 and following the submission of the project referral was granted conditional approval on 12th November 2021.

The Project was also granted State Ministerial approval (Ministerial Statement 1168) in May 2021.

The scope of this Annual Compliance Report is to satisfy Condition 20 of EPBC 2017/8094, addressing compliance with each of the conditions of the approval for the 2023 reporting period.

A. YALYALUP MINERAL SANDS PROJECT SUMMARY

A.1 PROJECT LOCATION, PROPONENT AND OVERVIEW

The Doral Mineral Sands Yalyalup Mineral Sands Project was granted Ministerial Statement 1168 in May 2021 to extract ore from the strand of heavy mineral deposit located within Mining Tenement M70/1400, 11km southeast of Busselton (Figure 16), Western Australia. Approximately 250,000t of heavy mineral concentrate (HMC) is expected to be produced per annum. HMC product generated from mining the deposit includes zircon, ilmenite and rutile.

The Project has a total disturbance envelope of 453.34ha. Of this area, 449.84ha is located within previously cleared land currently used for farming activities (i.e., agriculture/pasture).

The Yalyalup Mine commenced construction 15th November 2021 and entered the commissioning phase on the 14th April 2022. The mine is now in full production with a current expected mine life of 4 – 5 years.

B. SUMMARY OF MINING OPERATIONS

B.1 SUMMARY OF OPERATIONS FOR 2023

2023 Operation

The Yalyalup Mine has operated 7 days per week since commissioning 14th April 2022 (with the exception of maintenance shutdowns) and has continued to restrict the operating hours to daytime only (7am to 7pm). With reference to Figure 17, a brief summary of the progress of the mine during the reporting period is outlined below:

Q4 2022 (November 1st onwards)

- Excavation of Blocks 70, 71, 76 and 80 completed
- Back filling of mine voids Blocks 69, 74, 75 and 79 completed
- Progressive backfilling of mining voids Blocks 70, 76 and 80
- Progressive excavation of Blocks 53, 65, 72, 77, 81 and 82

Q1 2023

- Backfilling of mining voids Blocks 70,76 and 80 completed
- Progressive excavation of Blocks 53, 65, 72, 77, 81 and 82
- Progressive backfilling of mining voids Blocks 71, 72, 77 and 81

Q2 2023

- Excavation of Blocks 53, 65, 72, 77 and 81 completed
- Excavation of Block 82 partially completed – remaining areas to be excavated at a later date
- Backfilling of mining voids Blocks 71 and 77 completed
- Progressive excavation of Blocks 49-52 and 55-63
- Progressive backfilling of mining voids Blocks 53, 65, 72, 81 and 82

Q3 2023

- Excavation of Block 50 Ore 1 completed
- Excavation of Blocks 55 and 58-61 completed
- Excavation of Blocks 56, 62 and 63 partially completed - remainder to be mined once feed prep is moved
- Backfilling of mining voids Blocks 53, 65, 72 and 81 completed
- Backfilling of Block 82 current mine void completed
- Progressive excavation of Blocks 9-11, 45-47, 49, 51, 52 and 57
- Progressive backfilling of mining voids Blocks 55-57 and 62-63
- 11.76ha of rehabilitation completed in an area covering Blocks 69, 74, 75, 78 and 79 - area returned to pasture

Q4 2023 (to November 30th)

- Excavation of Blocks 9, 45-47 and 52 completed
- Excavation of Block 51 Ore 1 completed
- Excavation of Block 57 partially completed – remainder to be mined once feed prep is moved
- Progressive excavation of Blocks 10-12, 49 and Block 51 Ore 3
- Backfilling of mining voids Blocks 55 and 58-61 completed.
- Backfilling of mining voids Blocks 56-57 and 62-63 in their current state completed
- Progressive backfilling of mining voids 45 and 46

- Profiling of backfilled mining voids 70, 76 and 80 and parts of backfilled mining voids Blocks 71, 73-74, 77-79 and 81 in progress in preparation for rehabilitation.

C. COMPLIANCE

C.1 COMPLIANCE WITH EPBC EPBC 2017/8094

The Yalyalup Mineral Sands Project (EPBC 2017/8094) was declared a controlled action as per the EPBC Act 1999 on 8th February 2018 and following the submission of the project referral was granted conditional approval on 12th November 2021.

The Project was also granted State Ministerial approval (Ministerial Statement 1168) in May 2021.

EPBC 2017/8094 includes 30 conditions as tabled in **Table C-1** COMPLIANCE WITH EPBC 2017/8094 FOR THE yalyalup MINE IN 2023 below and during the reporting period there were no non-compliances to report.

Table C-1 COMPLIANCE WITH EPBC 2017/8094 FOR THE YALYALUP MINE IN 2023

COMPLIANCE RISK MANAGEMENT AUDIT TABLE

PROJECT: Yalyalup Mineral Sands Project

EPBC 2017/8094

Note:

- Phases that apply in this table = Pre-Construction, Construction, Operation, Decommissioning, Overall (several phases).
- Compliance Status: C = Compliant, CLD = Completed, NA = Not Audited, NC = Non – compliant, NR = Not Required at this stage.

Audit Code	Subject	Requirement	How	Evidence	Phase	Timeframe	Status	Further Information
Part A Condition 1	Clearing	For the protection of EPBC Act listed species and ecological communities the approval holder must not clear more than: a. 1.78 ha of habitat for Black Cockatoos, including no more than 102 trees with a diameter at breast height of greater than 500 mm and no more than a total of five trees containing suitable nesting hollows. b. 0.34 ha of Shrublands on southern Swan Coastal Plain Ironstones (Busselton area) including as a consequence of dewatering. c. Nine Banksia squarrosa subsp. Argillacea including as a consequence of dewatering.	Implement the project in accordance with EPBC 2017/8094 and Ministerial Statement 1168. Survey and clear delineation of approved disturbance boundary and clearing extent prior to clearing.	Report in Annual Compliance Report (ACR)	Overall	Life of project	C	No clearing has been undertaken outside the approved areas. Refer to Appendix A for clearing extent.
Part A Condition 2	Clearing	The approval holder must ensure that no clearing occurs outside the disturbance footprint	Survey and clear delineation of approved disturbance boundary and clearing extent prior to clearing.	Report in ACR	Overall	Life of Project	C	No clearing has been undertaken outside the disturbance boundary. Refer to Appendix A for clearing extent.
Part A Condition 3	Black Cockatoos	To mitigate impacts to nesting black cockatoos, the approval holder must, within two days prior to clearing any suitable nesting hollows, have a suitably qualified field ecologist investigate that suitable nesting hollow to determine if it is currently utilised by any black cockatoos for nesting. If any black cockatoo is detected utilising any hollow in any tree, the approval holder must: a. clearly identify and mark the tree in which a black cockatoo is identified utilising any hollow; and b. not clear any tree containing a currently utilised suitable nesting hollow or any vegetation within a ten metre radius of any such tree until after the year's breeding season.	Suitably qualified field ecologist to inspect suitable nesting hollows within 2 days of clearing Clearly identify and mark tree(s) being used and do not clear within 10 metre radius until after the years breeding season Implement relevant environmental procedures: • DMS-EP-9.1 Fauna Spotter Procedure • DMS-EP-11.1 Vegetation Clearing	Report in ACR	Overall	Life of Project	C	One potential black cockatoo nesting tree was inspected by a Zoologist on the day of clearing during the reporting period. No nesting was observed. Refer to Appendix B for inspection reports.
Part A Condition 4	Black Cockatoos	To mitigate the loss of five suitable nesting hollows within the development envelope, the approval holder must: a. install, in accordance with artificial hollow installation guidelines, at least fifteen artificial nesting hollows prior to the beginning of the first breeding season that will commence after the date of this approval decision. b. ensure that each installed artificial nesting hollow is: i. monitored and maintained in accordance with the artificial hollow maintenance guidelines for the life of the approval, with maintenance actions undertaken outside of the breeding season. ii. not installed in a manner that requires additional clearing of black cockatoos foraging and breeding habitat or within 10	Engage Artificial Nesting Hollow contractor to install 15 artificial nesting hollows as per artificial hollow installation guidelines. Monitor and maintain artificial hollows in accordance with the artificial hollow maintenance guidelines for the life of the approval, with maintenance actions undertaken outside of the breeding season Do not install artificial hollows in a manner that requires additional clearing of black cockatoos foraging and breeding habitat or within 10 metres of the edge of any part of the nearest road or building	Twice yearly artificial nesting hollow inspection and maintenance Report in ACR	Overall	Twice per year at least 4 weeks apart	NR	Following significant negotiations during 2022 with Dept of Transport and ARC Infrastructure, a contract agreement is in place and the Rail Safety Plan approved prior to the installation of artificial hollows. 15 hollows were installed within

COMPLIANCE RISK MANAGEMENT AUDIT TABLE

PROJECT: Yalyalup Mineral Sands Project

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Audit Code	Subject	Requirement	How	Evidence	Phase	Timeframe	Status	Further Information
		metres of the edge of any part of the nearest road or building, to reduce the risk of vehicle strike and human disturbance. c. ensure that each installed artificial nesting hollow is inspected at least twice each year, and at least 4 weeks apart, by a suitably qualified field ecologist during the breeding season for nine years following commencement of the action, to record any evidence of use by black cockatoos and to identify any maintenance requirements. The identified maintenance requirements must be implemented.	Schedule a suitably qualified field ecologist to inspect each artificial hollow at least twice a year and at least 4 weeks apart within the breeding season for 9 years following commencement of the action. Implement identified maintenance requirements as required					native vegetation north east of Perth, WA in March 2023.To date, two monitoring sessions have confirmed successful Carnaby Black Cockatoo breeding activity in 80% of the artificial hollows installed. See section D for detail
Part A Condition 5	Black Cockatoos	If, after nine years from commencement of the action, the approval holder is unable to provide the verification by a suitably qualified field ecologist of use by Black Cockatoos during the breeding season for three consecutive years the approval holder must, within ten years after commencement of the action: a. submit to the Minister for approval the details of an offset that meets the requirements of the EPBC Act Environmental Offsets Policy and will compensate for the permanent loss of the five suitable nesting hollows. b. submit to the Department a detailed assessment of the factors that caused the failure to achieve black cockatoos nesting in any artificial nesting hollow.	Engage DAWE Compliance officers within year 6 of the commencement of the action (Nov 2027) to discuss Cockatoo activity status. Consult with DAWE to determine requirements of the EPBC Act Environmental Offsets Policy and will compensate the loss of 5 Cockatoo hollows. Engage a Zoologist to report on factors that caused the failure of no Black Cockatoos nesting in any artificial nesting hollow.	Submit detail as per Condition 5 to the Minister Report in the ACR	Overall	> 9 years,< 10 years	NR	2023 is the second year of commencement of the action
Part A Condition 6	Black Cockatoos	All data, enquiries and findings of the monitoring required by Condition 4 must be published and remain publicly accessible for the remainder of the life of the approval on the website to contribute to potential research into the use of artificial nesting hollows by Black Cockatoos. These must be published within 60 business days of a suitably qualified field ecologist providing verification as required under Condition 4.c., or within 25 business days after submitting the assessment report required under condition 5.b.	Publish relevant monitoring and reporting on the Doral Website	Screenshot of uploaded document email to DAWE Compliance Report in the ACR	Overall	Within 60 days of verification as required for Condition 4c Within 25 days of verification as required for Condition 5b	NR	Due to vulnerability of potential poaching activities and sensitive nature of the breeding program and particularly the location, Doral has elected to maintain the report as confidential and thus has not published the cockatoo monitoring reports dated 20th October and 6th December 2023 on the Doral website. The reports have been submitted to DCCEEW as confidential. Detail of success can be found in section D

COMPLIANCE RISK MANAGEMENT AUDIT TABLE

PROJECT: Yalyalup Mineral Sands Project

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Audit Code	Subject	Requirement	How	Evidence	Phase	Timeframe	Status	Further Information
Part A Condition 7	Western Ringtail Possum and Black Cockatoo	To minimise impacts to the Western Ringtail Possum and Black Cockatoos, the approval holder must implement the Revegetation Management Plan.	Implement the Revegetation Management Plan	Report revegetation progress in the ACR	Overall	Life of Project	C	Revegetation McGibbon Track revegetation area commenced in 2022. Further infill planting was undertaken in 2023. See section E
Part A Condition 8	Vasse-Wonnerup System Ramsar Site	To mitigate impacts to the Vasse-Wonnerup System Ramsar Site, the approval holder must implement the Groundwater Licence Operating Strategy.	Implement the Groundwater Licence Operating Strategy	Report monitoring results of Groundwater Licence Operating Strategy in the ACR	Overall	Life of Project	C	Groundwater monitoring has been undertaken as per the Groundwater Licence Operating Strategy. The first Annual Groundwater Summary was published in March 2023. See section F
Part A Condition 9	Protected Matters	The approval holder must comply with and implement all WA conditions to the extent they relate to protected matters.	Implement the project in accordance with Ministerial Statement 1168	Report in the ACR and Compliance Assessment Report as per Ministerial Condition 4-6	Overall	Life of Project	C	Conditions have been complied with and reported in this ACR and the Compliance Assessment Report (CAR) as per Ministerial Condition 4-6
Part A Condition 10	Offsets	To compensate for the residual significant impacts to Black Cockatoos, *Shrublands on southern Swan Coastal Plain Ironstones (Busselton area)* and *Banksia squarrosa* subsp. *Argillacea,* the approval holder must: a) within 3 months from commencement of the action, submit an Offsets Strategy for approval by the Minister; and b) implement the Offset Strategy approved by the Minister in writing.	Submit an Offset Strategy for approval by the Minister	Correspondence to confirm submission to the Minister and Approval Report in the ACR	Pre-construction	Prior to Action	C	Offsets strategy was submitted with EPBC approval documentation and subsequent consultation and revisions undertaken in accordance with DCCEEW officers following amendments to EPBC Conditions on 4th Nov 2022 and again on 21st June 2023. Final version still in draft awaiting assessment by DCCEEW.

COMPLIANCE RISK MANAGEMENT AUDIT TABLE

PROJECT: Yalyalup Mineral Sands Project

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Audit Code	Subject	Requirement	How	Evidence	Phase	Timeframe	Status	Further Information
Part A Condition 11	Offsets	The Offsets Strategy must satisfy the requirements of the EPBC Act Environmental Offsets Policy, and must: a) include summary information on the impacted areas, and detailed baseline information on the proposed offset(s), achievable ecological benefits and timeframes for their achievement; b) include an assessment of risks to achieving the ecological benefit(s), and management strategies that will be applied to address those risks; c) outline the monitoring program(s) that will be implemented to determine progress towards, attainment and maintenance of the ecological benefits for the EPBC Act listed threatened species and communities at the proposed offset(s); d) specify how and at what frequency offset(s) management results, monitoring program findings and assessments of ecological benefits will be reported to the Department and the public; e) specify land tenure and management arrangements for the proposed offset(s), and the requirements of Condition 12 that apply to each offset area; and f) detail how the offset(s) will be protected, and ecological benefits maintained, in perpetuity.	Prepare Offset Strategy as per Condition 11 and submit for approval of the Minister	Correspondence to confirm submission to the Minister and Approval Report in the ACR	Pre-construction	Prior to Action	C	See condition 10 comments.
Part A Condition 12	Offsets	Subject to Condition 11(e), the approval holder must submit for the Minister's approval, within 3 months of the date of approval of the Offset Strategy, an Offset Management Plan for each of the offset sites specified in the approved Offset Strategy. Each Offset Management Plan must be, to the satisfaction of the Minister, consistent with the Department's Environmental Management Plan Guidelines, and the approved Offset Strategy, and must include: a. a table of management commitments to achieve the ecological benefits for relevant protected matters, including a reference to where the commitments are detailed in the Offset Management Plan; b. reporting and review mechanisms, and documentation standards to inform the Department and others annually regarding compliance with management commitments, and attainment and maintenance of ecological benefits specified in the approved Offset Strategy; c. a monitoring program, which must include: i. evidence that demonstrates progress towards, attainment of and maintenance of the ecological benefits for the protected matters ii. measurable performance indicators to monitor attainment of the ecological benefits for the protected matters; iii. the timing and frequency of monitoring to detect trigger values and changes in the performance indicators; and iv. trigger values for corrective actions.	Prepare one Offset Management Plan for each of the two Offset sites in accordance with Condition 12 items (a) to (h) and submit for to the Minister for approval. Implement the approved Offset Management Plans	Correspondence to the Minister within 3 months of approval of the Offsets Strategy Correspondence to confirm Minister approval Report in the ACR	Overall	Within 3 months of the date of approval of the Offsets Strategy	NR	Not yet required, see Condition 10 comments. See section F for proposed Offsets and revegetation progress.

Audit Code	Subject	Requirement	How	Evidence	Phase	Timeframe	Status	Further Information
		d. proposed corrective actions to ensure ecological benefits for the protected matters are attained or maintained, if trigger values are reached or performance indicators not attained; and e. links to relevant recovery and threat abatement plans and applicable conditions of approval (including State approval conditions) if any. The approval holder must implement each approved Offset Management Plan for the remainder of the life of the approval. Note: A single Offset Management Plan providing the above in respect of all offset sites specified in the approved Offset Strategy may be submitted in place of separate Offset Management Plans.						
Part A Condition 13	Offsets	If the Offset Management Plan for each of the offset sites specified in the approved Offset Strategy has not been approved by the Minister in writing within 5 months of the approval of the Offset Strategy, and the Minister notifies the approval holder that one or more submitted Offset Management Plans is/are not suitable for approval, the Minister may, at least two months after so notifying the approval holder, approve a version of the Offset Management Plan revised by the Department.	Submit Offset Management Plans for approval by the Minister. Consult with DAWE Compliance staff to ensure approval is achieved within 4 months	Correspondence to confirm Minister approval Approval of the Report in the ACR	Overall	Life of project	NR	Not yet required, see Condition 10 comments.
Part B Condition 14	Commencement of Action	The approval holder must notify the Department in writing of the date of commencement of the action within 10 business days after the date of commencement of the action.	Submit written notification to the Department within 10 business days of the commencement of the action	Correspondence to confirm notification sent and received Report in ACR	Construction	Within 10 days of commencement of the action	C	The action commenced on 15th November 2021 See Appendix D
Part B Condition 15	Commencement of Action	If the commencement of the action does not occur within 5 years from the date of this approval, then the approval holder must not commence the action without the prior written agreement of the Minister.	Commence the action within 5 years	Correspondence to confirm commencement notification sent and received Report in ACR	Construction	Within 5 years of approval	C	The action commenced on 15th November 2021 See Appendix D
Part B Condition 16	Records	The approval holder must maintain accurate and complete compliance records	All records with be maintained via the Environmental Management System (EMS)	Report in the ACR	Overall	Life of Project	C	All records are maintained with Doral's EMS
Part B Condition 17	Records	If the Department makes a request in writing, the approval holder must provide electronic copies of compliance records to the Department within the timeframe specified in the request.	All records with be maintained via the EMS	Correspondence of provision of information to DAWE as required	Overall	Life of Project	NR	No request was made in 2023
Part B Condition 18	Plans	The approval holder must: a. submit plans electronically to the Department; b. unless otherwise agreed to in writing by the Minister, publish each plan on the website within 20 business days of the date: i. of this approval, if the version of the plan to be implemented is specified in these conditions; or ii. that the plan is submitted to the Minister or the Department if the plan does not require the approval of the Minister but was not finalised before the date of this approval; or iii. that the plan is approved by the Minister; c. exclude or redact sensitive ecological data from plans published on the website or provided to a member of the public; and d. keep plans published on the website until the end date of this approval.	Environmental Management Plans will be submitted to the Minister electronically and published on the Doral website within 20 business days as per Condition 18(b)	Publish and send screen shot of Doral website Report in ACR	Overall	Within 20 business days of the submission to Minister	C	Approved Management Plans are posted on Doral's website
Part B Condition 19	Plans	The approval holder must ensure that any monitoring data (including sensitive ecological data), surveys, maps, and other spatial and metadata produced under a plan, is prepared in accordance with the Department's Guidelines for biological survey	Monitoring and other data as per Condition 19 prepared in accordance with DAWE Guidelines for biological survey and mapped data (2018) and submitted	Correspondence of submission to DAWE	Overall	Life of Project	C	Submitted with referral

COMPLIANCE RISK MANAGEMENT AUDIT TABLE

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Audit Code	Subject	Requirement	How	Evidence	Phase	Timeframe	Status	Further Information
		and mapped data (2018) and submitted electronically to the Department in accordance with the requirements of the plan.	electronically to the Department in accordance with the requirements of the plan.					
Part B Condition 20	Compliance Reporting	The approval holder must prepare a compliance report for each 12 month period following the date of commencement of the action, or otherwise in accordance with an annual date that has been agreed to in writing by the Minister. The approval holder must: a. publish each compliance report on the website within 60 business days following the relevant 12 month period; b. notify the Department by email that a compliance report has been published on the website and provide the weblink for the compliance report and documentary evidence providing proof of the date of publication of the report within 5 business days of the date of publication; c. keep all compliance reports publicly available on the website until this approval expires; d. exclude or redact sensitive ecological data from compliance reports to be published on the website; and e. where any sensitive ecological data has been excluded from the version published, submit the full compliance report to the Department within 5 business days of publication	Prepare and publish ACR for each 12 month period following the commencement of the action within 60 business days following the relevant 12 month period If sensitive ecological data is excluded from published report submit the full compliance report to the Department	Correspondence to DAWE and screenshot of published report on the Doral website Report in ACR	Overall	Within 60 business days following each 12 month period Within 5 business days of publication on the Website	C	The report is published on Doral's website and a screenshot provided to DCCEEW
Part B Condition 21	Non-Compliance Reporting	The approval holder must establish a compliance risk management system, prior to the commencement of the action to prevent incidents of non-compliance with these approval conditions, prior to the commencement of the action.	Prepare a Compliance Management Plan including Audit Table	Correspondence of Submission to DAWE Report in the ACR	Pre-construction	Prior to the Action	C	Compliance Risk Management (CRM) Table emailed to DAWE on 11 Nov 2021
Part B Condition 22	Non-Compliance Reporting	The approval holder must provide evidence of the compliance risk management system to the Department prior to the commencement of the action.	Prepare a Compliance Management Plan including Audit Table	Correspondence of Submission to DAWE Report in the ACR	Pre-construction	Prior to the Action	C	CRM Table emailed to DAWE on 11 Nov 2021
Part B Condition 23	Non-Compliance Reporting	The approval holder must implement the compliance risk management system from the commencement of the action for the remainder of the life of the approval.	Implement the Compliance Management Plan	Report in the ACR	Overall	Life of Project	C	The compliance management plan has been implemented
Part B Condition 24	Non-Compliance Reporting	The approval holder must notify the Department in writing of any: incident; non-compliance with the conditions; or non-compliance with the commitments made in plans. The notification must be given as soon as practicable, and no later than two business days after becoming aware of the incident or non-compliance. The notification must specify: a. any condition which is or may be in breach; b. a short description of the incident and/or non-compliance; and c. the location (including co-ordinates), date, and time of the incident and/or non-compliance. In the event the exact information cannot be provided, provide the best information available.	Notify DAWE of any: incident; non-compliance with the conditions; or non-compliance with the commitments made in plans as soon as practicable, and no later than two business days after becoming aware of the incident or non-compliance.	Correspondence of notification to DAWE Compliance section Report in the ACR	Overall	As soon as practicable and no later than two business days of becoming aware	NR	No non-compliances have occurred throughout 2023
Part B Condition 25	Non-Compliance Reporting	The approval holder must provide to the Department the details of any incident or noncompliance with the conditions or commitments made in plans as soon as practicable and no later than 10	Provide details of any incident or noncompliance with the conditions or commitments made in plans as soon as	Correspondence of incident notification	Overall	Within 10 business days	NR	No non-compliances have

COMPLIANCE RISK MANAGEMENT AUDIT TABLE

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Audit Code	Subject	Requirement	How	Evidence	Phase	Timeframe	Status	Further Information
		business days after becoming aware of the incident or non-compliance, specifying: a. any corrective action or investigation which the approval holder has already taken or intends to take in the immediate future; b. the potential impacts of the incident or non-compliance; and c. the method and timing of any remedial action that will be undertaken by the approval holder	practicable and no later than 10 business days after becoming aware of the incident or non-compliance. Notification information provided to be as per Condition 25	Report in the ACR		of the occurrence		occurred throughout 2023
Part B Condition 26	Audit	The approval holder must ensure that independent audits of compliance with the conditions are conducted as requested in writing by the Minister	Conduct independent audits as requested by the Minister	Report in the ACR	Overall	Life of Project	NR	No requests were received from the Minister in 2023
Part B Condition 27	Audit	For each independent audit, the approval holder must: a. provide the name and qualifications of the independent auditor and the draft audit criteria to the Department; b. only commence the independent audit once the audit criteria have been approved in writing by the Department; and c. submit an audit report to the Department within the timeframe specified in the approved audit criteria.	Provide details of auditor, audit criteria and an audit report to DAWE as per Condition 27	Correspondence of submission of details Report in the ACR	Overall	Life of Project	NR	No requests were received from the Minister in 2023
Part B Condition 28	Audit	The approval holder must publish the audit report on the website within 10 business days of receiving the Department's approval of the audit report and keep the audit report published on the website until the end date of this approval.	Publish the audit report on the Doral Website within 10 days of DAWE approval	Correspondence of submission of details Screenshot of Doral Website Report in the ACR	Overall	Life of Project	NR	No requests were received from the Minister in 2023
Part B Condition 29	Revision of Management Plans	The approval holder may, at any time, apply to the Minister for a variation to an action management plan approved by the Minister, by submitting an application in accordance with the requirements of section 143A of the EPBC Act. If the Minister approves a revised action management plan (RAMP) then, from the date specified, the approval holder must implement the RAMP in place of the previous action management plan	Apply for a variation to an action management plan approved by the Minister where required.	Report in the ACR	Overall	Life of Project	NR	No requests for revision of Management Plans were required.
Part B Condition 30	Completion of Action	Within 30 business days after the completion of the action, the approval holder must notify the Department in writing and provide completion data	Notify the Department of the completion of the action	Report in the ACR	Decommissioning	Within 30 business days of completion of the action	NR	Yalyalup Mine remains operational

D. SUITABLE NESTING HOLLOWS

EPBC 2017/8094 Condition 4 requires the installation of at least 15 artificial nesting hollows within the first breeding season to mitigate the loss of five suitable nesting hollows within the development envelope.

Significant negotiations were undertaken during 2022 with Dept of Transport and ARC Infrastructure for the installation of 15 artificial hollows northeast of Perth WA in a region with proven evidence of Carnaby Cockatoo breeding in recent years. Contract agreement is in place and installation implemented in March 2023.

D.1 MONITORING RESULTS

D.1.1 20TH OCTOBER 2023

Upon inspection on the 20th October 2023, 13 of the 15 Artificial Nesting Hollows (ANH) were being used by Carnaby's Cockatoos. There was chipping by black cockatoos in all 15 hollows. A score of 0-10 was used to rate the amount of chipping with '0' being none detected, and '10' requiring the post to be replaced.

The oldest nestling is in D11 it is 36 days old (it is the oldest of siblings), Table D-1: D11 nestling databelow:

TABLE D-1: D11 NESTLING DATA

Date measured	Incubation	Age	Date egg laid	70 days – Fledge from	Hatch date
20/10/23	29	36	16/8/23	23/11/23	14/9/23

Unfortunately, Corella's are nesting in D09, with one small nestling and one egg. There are signs of Carnaby's chewing on the post, however Corellas are very aggressive and seem to have taken the nest over from a 'prospecting' Carnaby's.

The eggs in D01 have failed (which is not uncommon). The temperature of the eggs confirmed they were cold. On removing eggs, they were light in weight and had cracks. By removing the eggs it is very likely that the hollow will be used by another pair.

There was significant chewing on the post and signs of prospecting in D02 and it will most likely be used this season.

Seven nestlings were photographed, leg banded, measured, weighed, aged (this will give us the date egg laid) and DNA taken, under licences from DBCA and DPIRD Animal Ethics.

Interestingly it would appear that prospecting has occurred not long after the 15 ANH were installed in March, as there is older chipping on some of the posts that has faded in colour which generally takes 5-6 months to occur.

A number of small, deceased nestlings were observed. This is normal as Carnaby's generally lay two eggs as insurance and let the younger nestling die if the first nestling is doing well. There are only 5-8% of twins (siblings) produced a year. The deceased nestlings were taken for DNA analysis as this has shown that about 25% of second nestlings are from a different male. See Figure **1**-4 below for examples of nestlings in hollows.

Figure 1– Hollow D05 With 20 Day Old Nestling

Figure 2– Hollow D06 With One 20 Day Old Nestling And One deceased

Figure 3 - Hollow D07 with 25 day old nestling and second egg

Figure 4 – Hollow D11 with 36 and 21 day old nestlings

D.1.2 6TH DECEMBER 2023

Upon inspection 6th December 2023, 12 of the 15 artificial nesting hollows are being used by Cockatoos.

There is chipping by black cockatoos in all 15 hollows. A score of 0-10 was used to rate the amount of chipping with ‘0’ being none detected, and ‘10’ requiring the post to be replaced.

The oldest nestling is in D11 at 80 days old (it is the oldest of siblings-twins), and will fledge on or just after the date of this inspection.

Unfortunately, Corella’s are nesting in D09, with one large nestling. There are signs of Carnaby’s chewing on the post, however Corellas are very aggressive and seem to have taken the nest over from a ‘prospecting’ Carnaby’s.

There have been re-lays in DO1 and DO4 (first attempt failed on eggs - which is not uncommon), with females flushed from both hollows. The 4-day old nestling in D01 will fledge in the middle of February and if DO4 is successful it/they may not fledge until March 2024.

There was significant chewing on the post and signs of prospecting in D02 and DO8 (FEMALE FLUSHED) and they may still be used this season. Unfortunately, the female in D08 was being harassed by Corellas whilst in the hollow.

Twelve nestlings were photographed, leg banded, measured, weighed, aged (this will give us the date egg laid and health score) and DNA taken, under licences from DBCA and DPIRD Animal Ethics. See Table D-2 and figures 5-8 for detail of hollow use and development of nestlings.

TABLE D-2: NESTLING DATA FOR ALL COCKATOO HOLLOWS 6TH DECEMBER 2023

Hollow No	Comments	Chipping score 0-10	Wood Chips Lts	Tree condition	Fixings and Hollow condition	Recommended repairs
D01	Female flushed, 1 x 4-day old Carnaby's nestling and one egg being incubated. significant chipping on post. SECOND NESTING ATTEMPT	10	5	Good	Good	New posts and chips
D02	No signs of nesting chipping on post by Carnaby's.	4	5	Good	Good	Chips
D03	51-day old female Carnaby's nestling. Chipping on the post.	5	5	Good	Good	New posts and chips
D04	Female flushed, two Carnaby's eggs. Chipping on the post. SECOND NESTING ATTEMPT	4	5	Good	Good	Chips
D05	64-day old female Carnaby's nestling. Chipping on the post	5	5	Good	Good	Chips
D06	67-day old Male Carnaby's nestling. Chipping on the post	5	5	Good	Good	New posts and chips
D07	69-day old female Carnaby's nestling. Chipping on the post	6	5	Good	Good	New posts and chips
D08	Female flushed on arrival, significant chipping on the post.	4	5	Good	Good	Chips
D09	Large Corella nestling. Carnaby's chipping on the post.	4	5	Good	Good	Chips
D10	Parents roosting in tree. 59-day old Male Carnaby's nestling. Chipping on the post	4	5	Good	Good	New posts and chips
D11	80 and 66 day old female Carnaby's nestlings, Chipping on the post.	4	5	Good	Good	Chips
D12	79-day old female Carnaby's nestling. Chipping on the post.	3	5	Good	Good	Chips
D13	59-day old Male Carnaby's nestling. Chipping on the post	4	5	Good	Good	Chips
D14	67-day old Male nestling Carnaby's. Chipping on the post.	4	5	Good	Good	Chips
D15	61-day old Male nestling Carnaby's. Chipping on the post.	4	5	Good	Good	Chips

Figure 5– D05 with 64 day old nestling

Figure 6– D06 with 67 day old nestling

Figure 7– D07 with 69 day old nestling

Figure 8 – D11 with 80 and 66 day old nestlings

E. WESTERN RINGTAIL POSSUM AND BLACK COCKATOO

EPBC 2017/8094 Condition 7 requires implementation of the Revegetation Management Plan. The McGibbon Track Threatened Ecological Community (TEC) extension revegetation is being undertaken to counterbalance direct impacts from clearing 2.72ha of degraded to completely degraded vegetation for the Yalyalup Mineral Sands Mine.

E.1 MCGIBBON TRACK TEC EXTENSION

The revegetation area is 4.7 hectares of degraded pasture located adjacent to the McGibbon Track TEC (SWAFCT10b – Shrublands of the Swan Coastal Plain Ironstones).

Throughout 2022, offset preparation activities were undertaken prior to planting during winter. The Offset was fenced with kangaroo and rabbit fencing (see Figure 11), weed control undertaken, slashing, rotary hoeing, discing, and ripping or discing performed dependent on the presence of surface ironstone.

A total of 9068 seedlings comprising 1739 overstorey and 7329 understory species were planted in winter 2022. In addition to seedlings, local provenance seed was broadcast over the prepared area at a rate of 4kg/ha.

Monitoring and weed maintenance commenced in spring 2022 following planting and in preparation for infill planting in winter 2023. Autumn and spring monitoring was conducted in April and November 2023, with chemical weed control and slashing conducted where required.

This first annual revegetation monitoring report (Appendix G) was received January 2024, summarising the first three monitoring events conducted from spring 2022 through to spring 2023 (see quadrat photos figures Figure 9, Figure 10 and Figure 13). The data summaries within the report provide a record of works undertaken and assist in establishing future trends against the fulfillment of closure criteria. Assessment of the McGibbon Track Revegetation will become more robust with each successive year of reporting, although will be subject to some limitations as detailed in section 4.3 of the monitoring report.

The general trend of the revegetation is positive with all metrics trending towards closure criteria. The major factor influencing revegetation within the site is the presence of massive ironstone and lateritic boulders at or near the surface. Areas where these boulders are near the surface are generally correlated to poorer germination and seedling establishment. The central area of the site considered ‘wetland’ type vegetation is most affected, attributing to its seasonal inundation and generally has less successful revegetation establishment. In contrast, revegetation in the ‘transitional’ areas has generally been more successful.

Within the transitional areas, the secondary factor influencing revegetation establishment has been weed competition, where areas of fertile soil have had higher weed burden competing with native germinants. There are three main areas (far northwest, northeast and south) that had high weed competition. Chemical weed control, slashing and infill planting in 2023 was targeted in these areas as they are most suitable for seedling establishment after weed competition was managed. It is expected that over time perennial vegetation establishing over surface boulders will perish due to lack of available soil affecting root growth and health.

Mining for the Yalyalup mineral sands project is continuing in surrounding areas and dewatering may have an ongoing influence on revegetation. The remnant vegetation on the adjacent McGibbon track is currently being managed for ground water availability with different water supplementation methods. Onflow effects have not yet been observed to have impacted the vegetation of the revegetation site but may have been a contributing factor to the lack of inundation observed within the 'wetland' area in winter 2023, whilst in the 2022 winter prior to nearby dewatering there was significant inundation. It is important to note that 2023's annual rainfall was well under the seasonal average which may also have affected lack of inundation. Onflow effects within the revegetation site will be monitored into the future.

It is expected that the closure outcome 'Exclusion of grazing stock and feral animals to secure revegetation success' is maintained and achieved. There have been no observed faults in the perimeter fence or gates since installation and monitoring of perimeter integrity is frequently inspected by Doral personnel. Although there have been some suspected signs of rabbit herbivory, there have been no definitive observations and there has been no significant impact on revegetation.

The closure outcome specifying 'Plants used in rehabilitation to be of local provenance' is assured as the species recruited from direct seeding planted by seedlings grown from seed, cuttings have been collected from within 20 km of the revegetation site prior to revegetation. All collections were managed by Cape Life, and strict management of provenance was implemented throughout the collection process.

The overstorey completion criteria targets is for the total surviving tree count within 5 years is required to be 250 overstorey woodland species (*Corymbia calophylla, Eucalyptus marginata and Agonis flexuosa)* that can provide habitat for the conservation significant Black-Cockatoos and Western Ringtail Possums. Observations are currently higher than completion criteria with an estimated 650 stems currently on site. During the early stage of revegetation high stems/ha counts are commonly recorded due to the initial flush of germinants in direct seeding. Although the number of trees expected to reach self-sustaining maturity is uncertain due to natural thinning and fluctuations in environmental conditions, observations represent a positive indicator in achieving the closure criteria targets.

Selection of understorey species for revegetation has been based upon historical local flora surveys to achieve an understorey composition similar to the adjacent good quality vegetation of the SWAFCT10b vegetation community within the McGibbon Track. Although the completion criteria for the species richness closure outcome is set at 'species richness of at least 50% of adjacent SWAFCT10b richness', the exact data to directly measure against is not yet known.

Historical flora surveys for SWAFCT10b have been undertaken by level 1 flora survey and are for the wider vicinity of the ironstone vegetation on McGibbon Track. As the level 1 flora survey was for a wider scope of area than just SWAFCT10b, the actual species richness within SWAFCT10b can be assumed to be less than the 67 different vascular species listed within the level 1 survey. The most recent monitoring event has shown a mean species richness of 7 species across monitoring quadrats and a total species richness across the site of 34 species, therefore achieving above the >50% completion criteria, at a minimum. Additionally, the survival of most species selected for revegetation is positive sign of revegetation success and the stems/ha count for understorey species is currently well above the <1000 stems/ha target at 5943 stems/ha.

Weed cover closure outcome is highly likely to be achieved as current weed cover of SWAFCT10b is 80-100% and completion criteria require 'no greater than 60% of the current weed cover within adjacent SWAFCT10b'. The completion criteria also states that no declared weeds are present within the revegetation area, and throughout the revegetation program none have been observed. Weed coverage within revegetation varies greatly between seasons as annual ryegrass from previous agricultural land use dominated in winter but dies off in summer. Weed control has been undertaken throughout the revegetation program, mainly to reduce impacts of Blackberry Nightshade (*Solanum nigrum)* Fleabane (*Erigeron bonariensis)* and Afghan Melon

(Cucumis myriocarpus). Approximately 5 individuals of the Arum Lily *(Zantedeschia aethiopica)* have also been treated. The impacts of weeds have been mentioned earlier in this discussion as a main factor influencing revegetation in the transitional areas but are being managed successfully through chemical weed control, slashing and infill planting.

Completion criteria requires that 'No dieback is present within the revegetation area at 5 years post establishment'. Although there have been no observations, dieback signs are likely to become more pronounced with revegetation maturity. Proteaceae loss, reduced canopy health of mature overstorey species and signs of dieback in nearby remnant vegetation will continue to be monitored for 5 years after revegetation is considered an appropriate time for formal dieback assessment.

The McGibbon Track Revegetation site is showing positive signs in its capacity to become sustainable with minimal management and self-sustaining once established but will continue to require further monitoring and management as the revegetation matures.

Figure 9- Monitoring quadrat 1 spring 2022.

Figure 10- Monitoring quadrat 1 spring 2023.

Figure 11 and Figure 12– Kangaroo and Rabbit proof fence with one way egress gate

Figure 13 – Revegetation progress autumn 2023.

F. VASSE-WONNERUP SYSTEM RAMSAR SITE

The Vasse-Wonnerup Wetland is located 4.6km to the north of the project. The numerical model does not predict any drawdown from dewatering activities of the Superficial Aquifer to extend to the Vasse-Wonnerup Wetland. To minimise changes to downstream flows, diversion of the intercepted upstream catchments around the mine envelope has been implemented.

EPBC 2017/8094 Condition 8 requires the implementation of the Groundwater Licence Operating Strategy (GLOS). Doral have implemented the GLOS throughout the reporting period. The Annual Water Year for the Yalyalup Mine is 1 January to 31st December.

F.1 GROUNDWATER LICENCE OPERATING STRATEGY RESULTS

Groundwater monitoring has been undertaken as per the Groundwater Licence Operating Strategy. The first Annual Groundwater Monitoring Summary (GMS), was published March 2023. See Appendix E for GMS. The 2023 GMS is expected in March 2024.

F.1.1 ASSESSMENT OF IMPACTS

F.1.1.1 Aquifer water levels

During the 2022 reporting period, the groundwater levels in the Superficial and Leederville aquifers at the Yalyalup mine have generally not been affected by any mining activities (i.e. pit dewatering and backfilling and off-site discharge), apart from some localised exceptions. Dewatering commenced in January 2022 and has continued to the end of reporting period (December 2022). Most of groundwater elevations recorded in the Superficial and Leederville monitoring bores during 2022 were within the historical range of values and within the range of natural seasonal water level variations associated with the winter dominated rainfall recharge to the aquifers and generally showed no evidence of any long-term trends. The only exceptions to the above were five Superficial aquifer bores YA_MB05S, YA_MB11S, YA_MB12S, YA_MB35_GDE and YA_MB37_GDE, which showed short-term (a few months) reduction in water elevations (i.e. drawdowns up to between 0.5 and 3 m), owing to mining and dewatering at the nearby active mine blocks. Additionally, Leederville aquifer bores YA_MB31_L, YA_MB30_W and YA_MB23_L showed abstraction in 2022, consistent with previous years. Overall, the impact on groundwater levels in the Superficial and Leederville aquifers due to the Yalyalup mine operation, over the 2022 reporting period, has been very limited. Any changes that have occurred (in the Superficial aquifer) are very localised (adjacent to the active pits) and temporary in duration. The recovery of water levels commences immediately mining of each active mine pit is completed, owing to the backfilling of mined-out pits with sand and clay tails.

F.1.1.2 Aquifer Chemistry

Water quality data collected during the 2022 review period from the Superficial and Leederville aquifers monitoring bores at the Yalyalup site show the groundwater to be generally fresh to marginal, acidic to neutral, with low total acidity, total alkalinity, SO4:Cl ratios and concentrations of sulphate, aluminium, and manganese. There were some elevated iron concentrations (up to 30 mg/L) in monitoring bores, but all were consistent with historical ranges. There were some temporary higher or lower concentration readings, but most of the water quality parameter values remained within a relatively small range of fluctuation consistent with historical data. In the majority of bores, no evidence of any unacceptable decreasing or increasing trends of changing water quality for the Superficial and Leederville aquifers was noted, including any salinity increase or significant change in chemical composition of water. The only exception to this occurred in the Superficial bores YA_MB05S and YA_MB06S. At YA_MB05S there were some water quality parameter increases (pH, salinity, total alkalinity, chloride, sulphate) since July 2022 due to the mining activities adjacent to this bore (e.g. seepage from the sand tails during nearby pit void backfilling). At bore YA_MB06S there were some water quality parameter decreases (pH, TDS, sulphate, chloride) from July 2022 onwards also due to nearby pit voids being backfilled with tails, where water from tails that had lower water quality parameters than YA_MB06S seeped through. Overall, the impact on groundwater quality in the Superficial and Leederville aquifers, due to the post mining operation over the 2022 reporting period, has been very limited. Any changes that have occurred are very localised and short-lasting. Surface water quality measured at selected surface water monitoring sites showed that existing off-site water discharge activities at the Yalyalup mine did not result in unreasonable changes in surface water quality at these locations, with only temporary spikes.

F.1.1.3 Effects on other users

Data collected during the 2022 reporting period indicate that the mining activities (i.e. active pit mining, pit dewatering, pit void backfilling) at the Yalyalup site result in only localised changes to water levels and water quality, with no increases on the regional scale. No impacts on other licensed Superficial aquifer users have been identified due to mining at Yalyalup. Three Leederville aquifer bores YA_MB31_L, YA_MB30_W and YA_MB23_L reported small drawdowns as a response to abstraction from these bores (not related to Yalyalup mining).

F.1.1.4 Effects on GDE's

No groundwater drawdown in the Superficial aquifer has been reported to extend beyond the Yalyalup mining area during 2022. Therefore, there should be no impact to any of three high value wetland GDEs, located approximately 6 km to either the northeast or southwest of the site. The magnitude of drawdowns along the McGibbon Track, where sensitive vegetation has been identified, will vary depending upon the proximity of the active mining pits. During 2022, short term (2 months) drawdowns of up to 2.6 m, where recorded at YA_MB35_GDE, owing to mining and dewatering of pit 91. These drawdowns are localised in the immediate area of the active mining (i.e. there were no drawdowns recorded in the nearby upstream bore (YA_MB08S) or downstream bore (SCPD28A). As per the current GWOS requirements, more frequent water level monitoring was undertaken during 2022, with the supplementation scheme being initiated in February and March 2022 (i.e. a total of 72,000 L was irrigated along the McGibbon Track using water carting). Vegetation monitoring increased to fortnightly once water level triggers were hit, with all existing sensitive vegetation still present along the McGibbon Track despite the limited surface supplementation. It should be noted that supplementation infrastructure is currently in place with the 2nd Yarragadee aquifer production bore YA_PB02 capable of supplying required volumes of clean water.

G. LAND OFFSETS

G.1 LAND ACQUISITION OFFSET STRATEGY

Following the granting of Ministerial Statement 1168, as per condition 11-2 a Land Acquisition Offset Strategy (LAOS) was prepared. The LAOS was submitted to the Department of Water and Environmental Regulation DWER (EPA) on 27th September 2021 and approved on 16th November 2021. The LAOS was made publicly available on the Doral website www.doral.com.au following approval.

The LAOS is inclusive of EPBC 2017/8094 Condition 11, and due to alterations of conditions within EPBC 2017/8094, Doral have been working with Department of Climate Change, Energy, Environment and Water (DCCEEW) to finalise version 8 and await response to the latest submission.

Offset Component 1 of the LAOS contains the objective of Doral to purchase a Site containing conservation significant flora and vegetation within the Southwest of WA to be transferred to DBCA for management. The proposed Offset Site is located at Lot 2 Jindong-Treeton Road and includes 3.78ha of SCP10b - Shrublands on southern Swan Coastal Plain Ironstones (Busselton area) (Gibson, et al., 2000) and a population of 15 Banksia squarrosa subsp. Argillacea. A site assessment was undertaken by an experienced DBCA Botanist, Mr Andrew Webb, on 7 August 2020 to assess the Site and provide a preliminary understanding of the conservation values and baseline conditions of the Site.

The Site is continuous with other DBCA and Shire of Busselton managed land, that also contains SCP10b. DBCA considers that with conservation purchase, the condition and linkage of remnant patches 1, 2, 3 and 4 is expected to be maintained and possibly improve and increase in size. Fencing to exclude kangaroos is considered fundamental to maximising the survival of natural regeneration which is occurring at the Site and also the existing 15 individuals of Threatened Banksia squarrosa subsp. Argillacea. In the event of loss of the existing 9 individual Banksia squarrosa subsp. Argillacea plants within the potential dewatering impact area of the Yalyalup mine, Doral propose to enact a mitigation plan in agreement with DBCA to increase the number of species to a further minimum of 9 plants ensuring a total of 26 individuals within the offset site. The pastured extent of the Site combined with kangaroo exclusion also provides additional scope for future ironstone revegetation planting and Threatened flora translocation by DBCA. The majority of the Site is not seasonally inundated and as such would also allow for all year access which would greatly assist with weed management and revegetation activities. DBCA considers it is likely that this location could be a valuable future translocation Site for ironstone taxa.

As at January 2024, the land transfer as lodged by DBCA to Landgate is awaiting finalisation by the State Solicitors Office (verbal comm Annie Greig DBCA to Craig Bovell Doral, Jan 2024).

The second offset component was a site containing Black Cockatoo potential breeding and foraging habitat within the Southwest of WA which will be placed under Conservation Covenant for conservation purposes. The Offset Site, owned by Doral, is located at Lot 348 Boyanup Road West, Stratham and includes 8.4ha of Black Cockatoo potential breeding and foraging habitat.

G.2 STRATHAM OFFSET

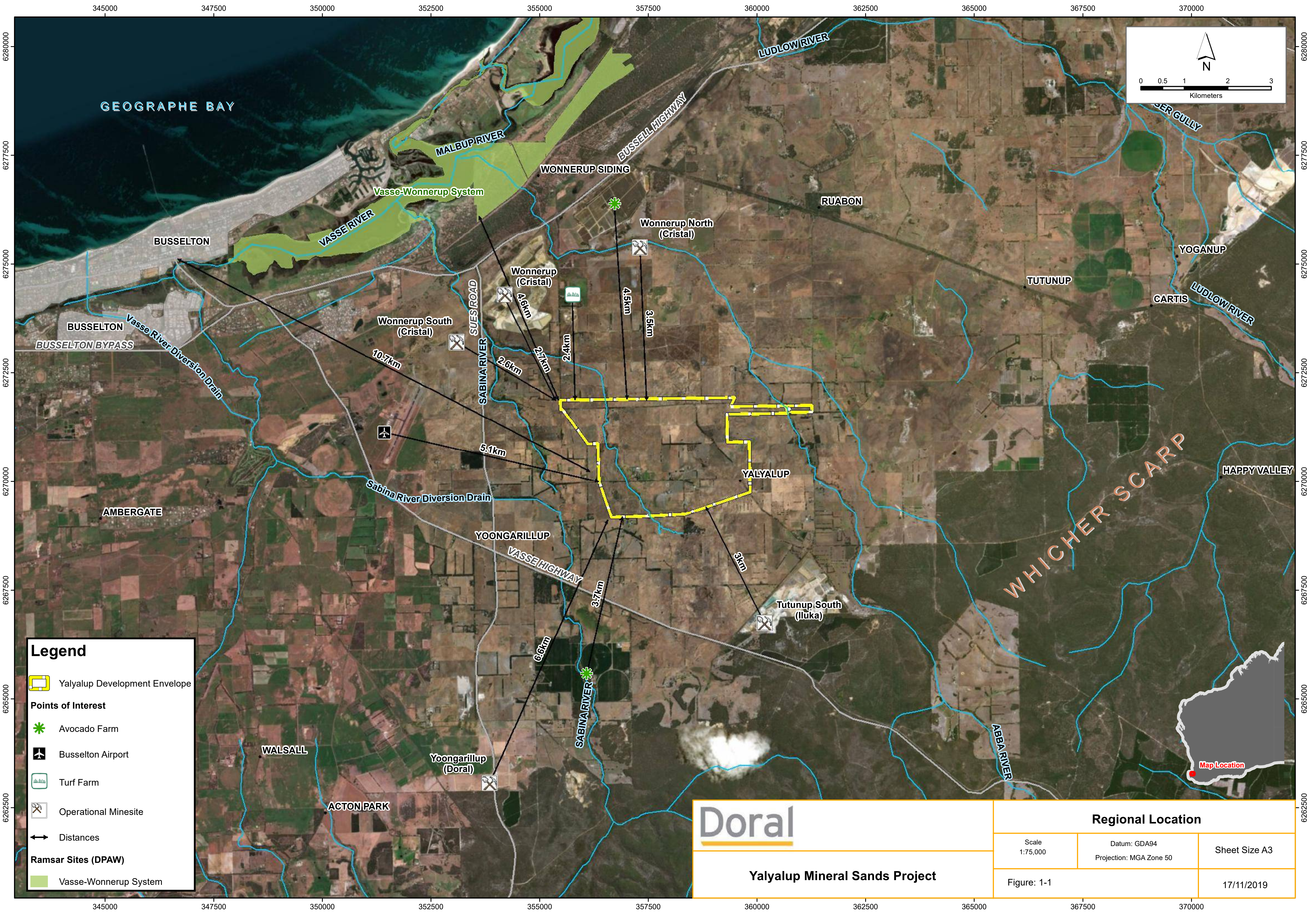
Throughout 2022, offset preparation activities were undertaken prior to planting during winter. The Offset was fenced with kangaroo and rabbit fencing (see Figure 14 and 15), weed control undertaken and rotary hoeing/ mounding performed. Of the 3,820 seedlings 841 were Banksia grandis, Banksia attenuata and

Corymbia calophylla species. Follow up weed control was implemented in October 2022. Spring monitoring was conducted in September 2023. See Appendix F for Stratham Monitoring Spring 2023 data sheets.

Figure 14 and Figure 15- Kangaroo and Rabbit proof fencing installed with one way Kangaroo egress gate

FIGURE 16

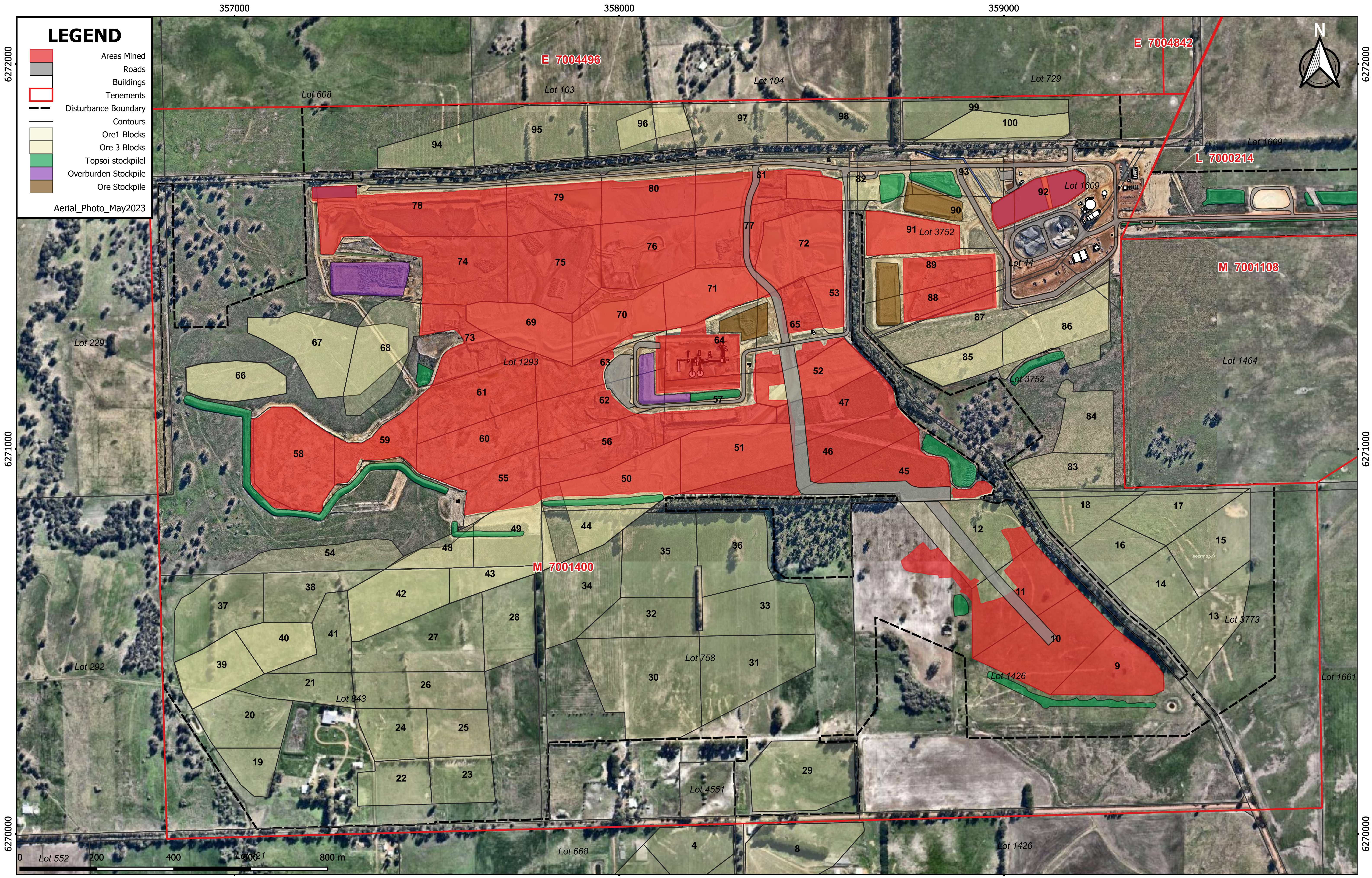
Locality Plan



GEOGRAPHE BAY
MALBUP RIVER
Vasse-Wonnerup System
VASSE RIVER
BUSSELTON
BUSSELTON
BUSSELTON BYPASS
Vasse River Diversion Drain
WONNERUP SIDING
BUSSELL HIGHWAY
LUDLOW RIVER
RUABON
Wonnerup North (Cristal)
Wonnerup (Cristal)
Wonnerup South (Cristal)
SUES ROAD
SABINA RIVER
TUTUNUP
YOGANUP
CARTIS
LUDLOW RIVER
HAPPY VALLEY
WHICHER SCARP
YALYALUP
Sabina River Diversion Drain
AMBERGATE
YOONGARILLUP
VASSE HIGHWAY
Tutunup South (Iluka)
Yoongarillup (Doral)
WALSALL
ACTON PARK
ABBA RIVER
SABINA RIVER
10.7km
5.1km
2.6km
4.6km
2.7km
2.4km
4.5km
3.5km
3km
3.7km
6.6km
N
0 0.5 1 2 3
Kilometers
Map Location
Legend
Yalyalup Development Envelope
Points of Interest
Avocado Farm
Busselton Airport
Turf Farm
Operational Minesite
Distances
Ramsar Sites (DPAW)
Vasse-Wonnerup System
Doral
Regional Location
Scale 1:75,000
Datum: GDA94
Projection: MGA Zone 50
Sheet Size A3
Yalyalup Mineral Sands Project
Figure: 1-1
17/11/2019

FIGURE 17

Yalyalup Minesite End of Year Map



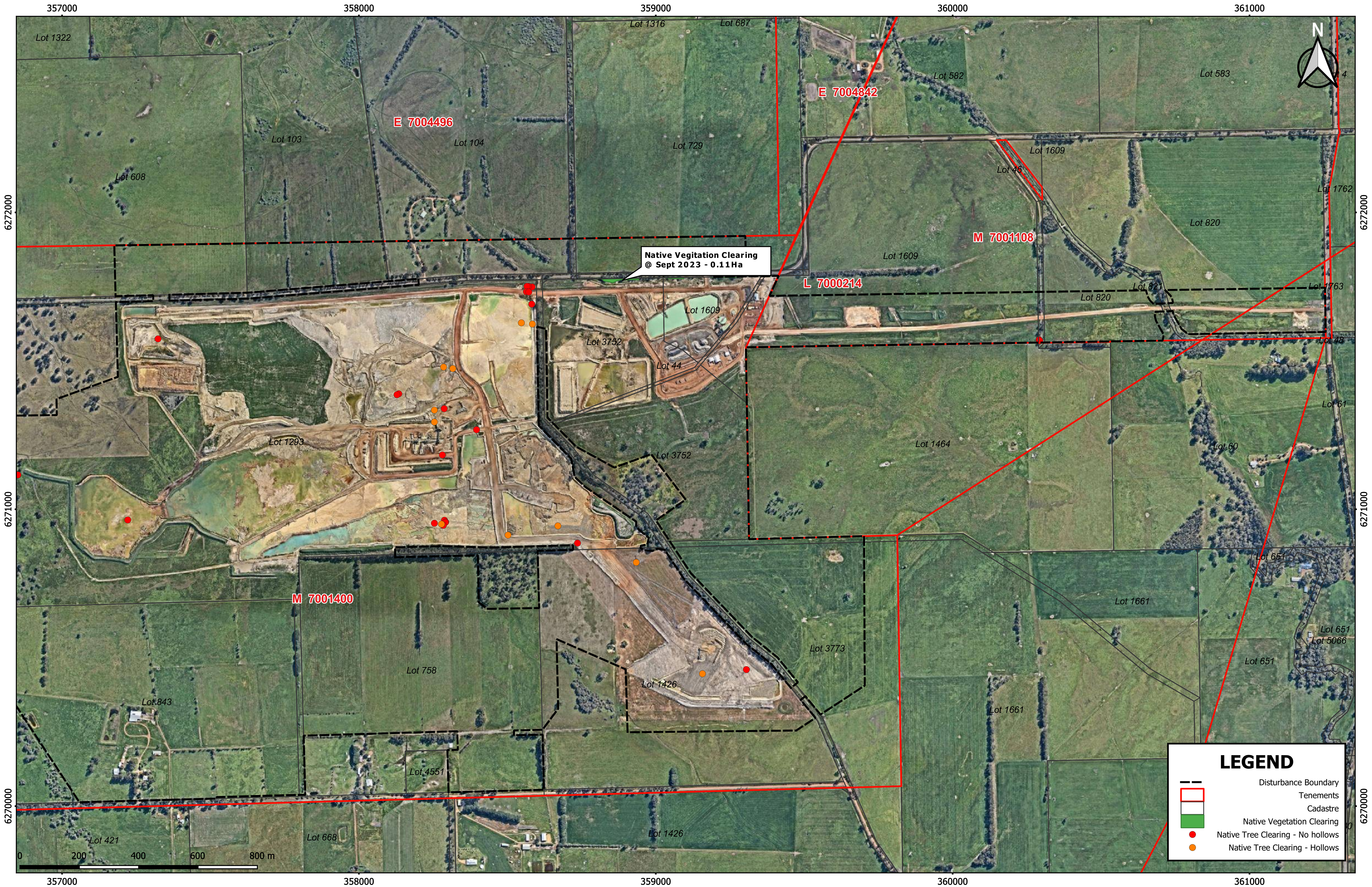
DORAL MINERAL SANDS - YALYALUP
EOM MAP - AREAS MINED - DECEMBER 2023

GDA94 / MGA zone 50
Scale: 1:8500 @ A3
File Name: Yalyalup_EOM_Map
Printed at: 2/1/2024
Drawn By: ARM / RDM

APPENDICES

APPENDIX A

Native Vegetation Clearing Map



DORAL MINERAL SANDS - YALYALUP
NATIVE VEG / TREE CLEARING @ SEPT 2023

GDA94 / MGA zone 50
Scale: 1:11000 @ A3
File Name: Yalyalup-Native Veg Clearing-0923
Printed at: 18/10/2023
Drawn By: ARM / RDM

APPENDIX B

Yalyalup Clearing Supervision Report

Greg Harewood
Zoologist
PO Box 755
BUNBURY WA 6231
15 September 2023

Doral Mineral Sands Pty Ltd
25 Harris Road
PICTON WA 6229

Attention: Julie Edwards

Dear Julie

RE: Post Clearing Report – Yalyalup Mineral Sand Mine – Removal of Habitat Tree – 23 August 2023

This letter serves as the "post clearing report" for recent tree removal undertaken at the Yalyalup Mineral Sand Mine. Doral are in the process of expanding existing operations and for this to proceed some previously identified "habitat trees" required removal with clearing being undertaken in stages. This stage of clearing was undertaken on the 13 December 2021.

In accordance with the approved management plan the removal of any of the identified habitat trees (Harewood 2020) and other vegetation requires a "fauna spotter" be employed during clearing. In this instance the task of fauna spotter was undertaken by myself under a regulation 28 licence (No. FR28000042-6) "Fauna Taking (Relocation) Licence" and "Authorisation to Take or Disturb Threatened Species" (Section 40 of the Biodiversity Conservation Act 2016) – (TFA 2020-0066-3) issued by the Department of Biodiversity Conservation and Attractions (DBCA).

One tree was removed (habitat tree = wpt 479 (Harewood 2020)). Prior to clearing the tree was examined from ground level for evidence of occupation/use. A drone was also used to examine hollows/nests when considered warranted.

The tree (a large very large marri) contained two apparent large hollows (one occupied by bees) and several smaller hollows none of which were found to have any obvious signs of current use/occupation. The tree was felled without incident, with no fauna being detected.

If you have any questions or queries relating the information provided here please contact the undersigned on 0402 141 197 / gharewood@iinet.net.au

Greg Harewood
Zoologist

REFERENCES

Harewood, G. (2020). Fauna Assessment Yalyalup Mineral Sands Project. Unpublished report for Doral Mineral Sands Pty Ltd.

APPENDIX C

Yalyalup Variation Notice

Mr Craig Bovell
OSHE Superintendent
Doral Mineral Sands
25 Harris Street
PICTON WA 6229

EPBC 2017/8094: Yalyalup Mineral Sands Project - variation to conditions of approval.

Dear Mr Bovell

Thank you for your letter of 4 August 2022 requesting a variation to the *Environment Protection & Biodiversity Conservation Act 1999* (EPBC Act) conditions of approval for the above approved action. I note that since then department officers have consulted with you on the proposed variation and, on 28 October 2022, Doral agreed to a version of the proposed variation of conditions.

Officers of the department have advised me on the proposed variation. On this basis, and as a delegate of the Minister for the Environment and Water, I have decided to vary, in accordance with section 143 of the EPBC Act, the conditions of approval to vary the requirements for the Offset Strategy and Offset Management Plan(s).

My decision to vary the conditions of approval is attached for your information. Please note that the decision will shortly be published on the Department's referral notices webpage.

The Department has an active monitoring program which includes monitoring inspections, and desktop document reviews and audits. Please ensure that you maintain accurate records of all activities associated with the conditions of approval.

Should you require further information regarding my decision please contact Vaughn Cox on 02 6274 2005, or by email at post.approvals@dccew.gov.au.

Yours sincerely

Kim Farrant
Branch Head
Assessment (Vic, Tas) & Post Approvals Branch
Environment Standards Division

4 November 2022

Attachment: Variation to conditions of approval.

APPENDIX D

Notification of commencement of Operations

Karim Sabetraftar
Project Manager
Environmental Assessments West (WA, SA, NT) Branch
Department of Agriculture, Water and the Environment
Karim.sabetraftar@environment.gov.au

22 November 2021
By Email

Dear Karim

RE: (EPBC 2017/8094) Yalyalup Mineral Sands Project, WA
Notification of the Commencement of the Action

I am writing to advise you that the Yalyalup Mineral Sands Project WA (EPBC 2017/8094) commenced on Monday 15th November 2021.

This notification is within 10 Business days after the commencement of the action in accordance with Condition 14 of the approval decision made on 12th November 2021 and under the Controlling Provisions:

- Wetlands of international importance (sections 16 and 17B),
- Listed Threatened Species and Communities (sections 18 and 18A), and
- Listed migratory species (sections 20 and 20A).

A copy of the Compliance Risk Management System as required by Condition 22 was submitted to DAWE prior to commencement on 11th November 2021 and acknowledged by email (Karim Sabetraftar) on 11th November 2021.

As required by Condition 18, the following Environmental Management Plans are posted on the Doral website www.doral.com.au/publications :

- DMS-YAL-6.1 Yalyalup Revegetation Management Plan,
- DMS-YAL-2.2 Groundwater Licence Operating Strategy V023e,
- DMS17-004 Yalyalup Offsets Strategy_V4.

Please don't hesitate to contact me on craig.bovell@doral.com.au or 0417 951 202 if you have any queries.

Kind Regards

Craig Bovell
OSHE Superintendent
Doral Mineral Sands

APPENDIX E

Annual Groundwater Monitoring Summary

Yalyalup Mineral Sands Project

Annual Groundwater Monitoring Summary GWL206603(1)

1 January to 31 December 2022

Prepared for:

Doral Mineral Sands Pty Ltd

March 2023

AQ2 Pty Ltd
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Author:	B Kozikowska		
Reviewed:	A Hoare		
Approved:	A Hoare		
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Date:	06 April 2023		
AQ2 Ref:	F:\136\3.C&R\136P_063b.docx		

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Appendices

1. INTRODUCTION

Doral Mineral Sands Pty Ltd (Doral) operates the Yalyalup mineral sands mine, located approximately 11 km south-east of Busselton, Western Australia (Figure 1). The Yalyalup mineral sands deposit is located within Mining Lease M70/1400 and Miscellaneous Lease L70/214, which covers an area of approximately 2,290 hectares, halfway between Iluka's Tutunup South Mine (closed in 2018) and Tronox's Wonnerup Mine (operating and northern extension).

Mining activities at Yalyalup commenced in Q4 2021, with the first ore mined in Q1 2022. The expected mine life is scheduled for six years, with three and a half years of the mining phase and the remainder being startup and closure. To enable optimal resource recovery, the mining occurs below the groundwater level and as a result, dewatering of the open-cut pits is required to provide dry mining conditions. Superficial aquifer dewatering flows are expected to vary across the project duration, depending on the mining plan and schedule.

Water supplies (up to 1.6 GL/year) are required for mineral ore processing and are sourced from recycled water from hydraulically returned tailings (i.e. sand and clay fines pumped to the mine void and solar evaporation ponds), rainfall runoff, pit dewatering water and supplemented by pumping from the external production bore in the Yarragadee aquifer (only during periods of water shortfall).

1.1. Groundwater Licences and Operating Strategy

During 2022, Doral held two 5C groundwater licences (GWL) at the Yoongarillup mineral sands mine, the details of which are as follows:

- GWL206603(1) allows water to be abstracted from the Superficial aquifer within the Busselton-Capel Groundwater sub-area for dewatering for mining purposes, with an annual allocation of 750,000 kL (i.e. 0.75 GL).
- GWL202591(4) allows abstraction from the Yarragadee aquifer for domestic use, dust suppression, mineral ore processing and rehabilitation purposes, with an annual allocation of 394,000 kL (i.e. 0.394 GL).

It should be noted that GWL202591 initially covered the abstraction from the Yarragadee aquifer at Doral's nearby Yoongarillup mine. However, this GWL was amended on 3 December 2021, (GWL202591(4)), reflecting changes to locations of water sources and authorised activities (to allow abstraction from the Yarragadee aquifer at the Yalyalup mine). GWL202591(4) superseded GWL202591(3) and is valid until 19 March 2029.

Details of the GWLs are outlined in Table 1 below, with copies presented in Appendix A.

Table 1 Groundwater Licence Details Active Over 2022

Aquifer	Licence	License Period	Allocation (kL/annum)	Location of Activity	Purposes (as stated on licence)
Superficial	GWL206603(1)	14/11/2021 – 30/12/2030	750,000	M70/1400	Dewatering for mining purposes
Yarragadee	GWL202591(4)	03/12/2021-19/03/2029	394,000	L70/214, M70/459, M70/1400	Domestic use, dust suppression for mining purposes, mineral ore processing and other mining purposes and rehabilitation purposes

The management of Superficial and Yarragadee groundwater abstractions covered by GWL206603(1) and GWL202591(4), respectively is undertaken in accordance with the Groundwater Operating Strategy (GWOS) prepared for the Yalyalup mine site and approved by the Department of Water and Environmental Regulation (DWER) in December 2021 (AQ2, 2021b). A copy of the current GWOS for the Yalyalup site is also presented in Appendix B.

1.2. This Report

As per the requirements of the current GWOSs and GWLs, a Groundwater Monitoring Summary (GMS) should be prepared at the end of each water year (1 January to 31 December), with reporting expanded to a Groundwater Monitoring Review (GMR) every three years and submitted to DWER by 31 March each year.

This GMS has been prepared by AQ2 Pty Ltd (AQ2) on behalf of Doral and covers the Superficial aquifer licence GWL206603(1) for the reporting period, from 1 January to 31 December 2022. This GMS report presents the results of the abstraction record and monitoring compliance associated with Doral's Superficial groundwater licence and covers the impacts that the water abstraction (from the Superficial aquifer) is having on the aquifers, the environment and other users. The report is produced in line with *Operational Policy No 5.12 – Hydrogeological Reporting associated with a Groundwater Well Licence* (DoW, 2009).

It should be noted that the results of the abstraction record and monitoring compliance associated with the Yarragadee aquifer for water supply (under GWL202591(4)) at the Yalyalup site, are not presented in this GMS as they are covered by a standalone annual GMS prepared for the Yoongarillup mine, which primarily covers the 2022 monitoring results associated with the Superficial aquifer licences (GWL182770(1) and GWL182775(1)) and the Yarragadee aquifer licence GWL202591(4) for the Yoongarillup mine.

2. PHYSICAL SETTINGS

2.1. Location and Landform

The Yalyalup project is located approximately 11 km south-east of Busselton (Figure 1) and situated close to:

- RAMSAR listed Vasse-Wonnerup System Wetland (~4.6 km north-north west).
- Tronox's Wonnerup Mineral Sands Mine (~4 km north-north west) – active.
- Iluka Resources' Tutunup South Mineral Sands Mine (~2.5 km south east) – inactive (rehabilitated).
- Doral's Yoongarillup Mineral Sands Mine (~6 km southwest) – inactive (rehabilitation in progress).

The project lies within the Swan Coastal Plain, which in the area slopes gently to the north west from maximum elevations of approximately 50 mAHD at the base of the Whicher Scarp, to minimum elevations at or close to the sea level (i.e. 0 mAHD; the Vasse-Wonnerup wetlands system and the coastline). The elevations across the mine site generally range between 22 mAHD in the north west and 30 mAHD in the south east, sloping towards the north west.

2.2. Drainage

The Yalyalup mine site is located within the Wonnerup (Busselton Coast) Surface Water Management subarea and is not located within a proclaimed area for surface water management (DWER, 2009).

The project is situated within the Lower Sabina River subcatchment area. The Lower Sabina River flows from below the Sabina Diversion Weir to the RAMSAR listed Vasse-Wonnerup Wetlands. The Lower Sabina, Lower Vasse, Abba and Ludlow rivers drain into the Vasse-Wonnerup Wetlands, before discharging through the Wonnerup Inlet into Geographe Bay.

The Vasse-Wonnerup Wetlands are an environmentally sensitive surface water receptor. Most of the Lower Sabina catchment has either been cleared for agricultural uses or for other mining operations (i.e. Tronox's Wonnerup Mineral Sands Mine in the northern portion). The Sabina River and Vasse River, both tributaries to the Vasse-Wonnerup Wetlands, have been historically modified with diversions to reduce the flooding risk to Busselton.

The Sabina Diversion Weir was constructed to allow overflow during extreme rainfall events from the Upper Sabina to the Lower Sabina, with regular flows through the Sabina Diversion Drain. The weir was over-designed and the Upper Sabina catchment no longer contributes any flow directly to the Lower Sabina river, although some minor sub-drains in the upper catchment may spill in large events (Marillier, 2018). The flow upgradient of the Sabina diversion weir is directed through the Sabina Diversion Drain to the Vasse Diversion Drain system and out to the Geographe Bay, rather than to Vasse-Wonnerup Wetlands.

Several roads and man-made drains installed in the 20th century have modified the natural drainage patterns. The project's mine development is situated along Princefield roadside drain and other first order drainage lines, which contribute to a tributary of the Lower Sabina River (downstream of the Sabina Diversion Weir).

The Whicher Area Surface Water Management Plan (DWER, 2009) does not list the Sabina or Abba Rivers as being connected to the groundwater system. However, the shallow depth of unconfined groundwater at Yalyalup could suggest the possibility of groundwater discharge occurring as baseflow in these rivers. Notwithstanding, hydrographs for both rivers clearly indicate a cessation of the river flow during summer periods, with limited rainfall recharge. Therefore, there is limited or no groundwater connection with the surface water, resulting in minimal or no groundwater contribution to the rivers' baseflow. The surface water flow regime is therefore likely to be dominated by high-rainfall periods generating surface water runoff, rather than any substantial groundwater flow component.

2.3. Climate and Rainfall

The Yalyalup project area has a Mediterranean type climate, characterised by hot dry summers and cold wet winters. The nearest Bureau of Meteorology (BoM) weather station with long-term data averages is Busselton Aero (Station No. 9603) and Busselton Shire (Station No. 9515), approximately 5 and 10 km, respectively to the north-east of the study area.

At the Yalyalup area, the long-term average annual rainfall (1877-2022) is 805 mm, while the more recent, short-term average annual rainfall (1998-2022) is 683 mm, which is 85% of the long-term average, indicating a general decline in rainfall in the study area.

During 2022, an annual rainfall of 636 mm was recorded, 7% and 21% below the short-term and long-term annual averages, respectively.

Rainfall is greatest during the winter months (May to September) and peaks in July. Conversely, monthly annual pan evaporation data obtained from BoM's Busselton Aero station, shows that evaporation is lowest during the months of May to August and highest during the dry summer months, with a mean pan evaporation of about 1,220 mm. The long-term average annual evaporation rate is about 2 times higher than the annual rainfall for 2022.

Monthly rainfall records for the 2022 review period, along with the historical data, are presented in Figure 2 and summarised in Table 2.

Table 2 Rainfall and Evaporation Statistics (Station Nos. 9515 and 9603)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Long-term Average Rainfall Busselton Shire (mm) (1877-2022))	10.2	10.6	20.9	41.3	113.9	164.6	161.3	115.1	74.5	49.1	24.5	12.7	805.4
Short-term Average Rainfall Busselton Aero (mm) (1998-2022)	13.0	6.8	20.1	36.8	101.2	122.1	134.8	107.5	73.5	32.8	23.3	9.4	683.2
Rainfall (mm) Busselton Aero 2022	0	3	7.8	42.6	87.4	86.4	158.8	125.6	74	34.6	15.8	0	636.0
Long-term Average Pan Evaporation Busselton (mm)*	192	157	135	78	60	42	50	53	70	91	130	181	1,239

From: *Evaporation Data for Western Australia (1987), Dept. of Agriculture

3. HYDROGEOLOGY

3.1. Geology

The Yalyalup project is located within the southern part of the Perth Basin, an elongate north–south rift trough with a series of sub-basins, shelves, troughs and ridges. The study area is wholly contained within the Bunbury Trough, a sub-basin containing a Permian–Cretaceous succession up to 11 km thick. The sub-basin is wedged between the Vasse Shelf and the Yilgarn Craton, bounded to the east by the Darling Fault and to the west by the Busselton Fault. Detailed descriptions of the local geology and groundwater system are given by Iasky (1993), Crostella and Backhouse (2000), and Baddock (2005).

Yalyalup geology and the groundwater occurrence in the upper 900 m of the Perth Basin at the Yalyalup area, is summarised in Table 3.

Table 3 Summary of Stratigraphy and Hydrogeology in the Yalyalup Area

<table>
<tr><th>Age</th><th>Formation</th><th>Stratigraphy</th><th>Thickness (m)</th><th>Lithology</th><th>Hydrogeology</th></tr>
<tr><td rowspan="3">Quaternary - late Tertiary</td><td rowspan="3">Superficial</td><td>Bassendean Sand</td><td>0.5-3</td><td>Fine to medium sub-rounded quartz sand</td><td>Superficial aquifer</td></tr>
<tr><td>Guildford Formation</td><td>2-5</td><td>Clay and sandy clay with occasional discontinuous sand lenses</td><td>Local aquiclude</td></tr>
<tr><td>Yoganup Formation</td><td>2-5</td><td>Leached and ferruginised beach sand conglomerate and clay. Local laterite.</td><td>Superficial aquifer</td></tr>
<tr><td colspan="6">UNCONFORMITY</td></tr>
<tr><td rowspan="2">Cretaceous</td><td rowspan="2">Leederville</td><td>Mowen Member</td><td>1-10</td><td>Clay and silty clay, with thin interbedded silt, clayey sand and fine grained sand</td><td>Regional aquitard; local Leederville aquifer (when significant sand is present)</td></tr>
<tr><td>Vasse Member</td><td>50-100</td><td>Fine to medium grained quartz sandstone and interbedded shale.</td><td>Leederville aquifer</td></tr>
<tr><td colspan="6">UNCONFORMITY</td></tr>
<tr><td rowspan="4">Mid-late Jurassic</td><td rowspan="4">Yarragadee</td><td>Unit 1</td><td>0-50</td><td rowspan="4">Medium to coarse grained, weakly consolidated sandstone, minor siltstone and shales</td><td rowspan="4">Yarragadee aquifer</td></tr>
<tr><td>Unit 2</td><td>0-250</td></tr>
<tr><td>Unit 3</td><td>200-500</td></tr>
<tr><td>Unit 4</td><td>0-100</td></tr>
</table>

The upper geological sequence comprises the Quaternary-late Tertiary aged Superficial Formations, which are represented at the Yalyalup site by the Bassendean Sand towards the top, the Guildford Formation and the Yoganup Formation towards the base. The Bassendean Sand comprises a thin bed of fine to medium grained aeolian sand. The Guildford Formation consists predominantly of silty to sandy clay of fluvial origin. The Yoganup Formation comprises leached and ferruginous coarse grained beach sand, with localised concentrations of heavy minerals and some sandy silt and clay layers. The superficial deposits commonly contain ironstone caprock, colloquially known as Coffee Rock, in the zone of water table fluctuation. At the Yalyalup site, the Coffee Rock is generally 2 to 3 m thick and is exposed at the surface in the western side of the project, near and along the McGibbon Track. The thickness of the Superficial Formation is irregular, reaching a maximum of 12 m at the site, but generally being 7 to 8 m thick.

The Superficial Formation is unconformably underlain by Cretaceous age, riverine and deltaic sediments of the Leederville Formation, comprising discontinuous interbedded weakly consolidated sandstone, clayey sand, silt and shale. Three member units of the Leederville Formation are identified: Vasse Member, Mowen Member, and Quindalup Member, with only Vasse and Mowen Members present in the Yalyalup area. The lower Vasse Member is highly stratified, containing sand beds interbedded with clay aquitards. Sand beds are generally up to 10 m thick with an overall unit thickness of 100 m at the project site. The upper Mowen Member is dominated by clay and silt with some thin interbedded silty to medium grained sands, with a thickness of up to 10 m. The Mowen Member is likely to be very thin and has a greater sand content, especially on the eastern side of the project area.

The Yarragadee Formation (the aquifer being targeted for the mine water supply) underlies the Leederville Formation, comprising predominantly weakly consolidated, medium to very coarse grained quartz sandstone, with minor siltstone and shale beds. Based on lithology and age, this formation has been divided into four sub-units (sequentially, Unit 1 to Unit 4; Baddock, 2005). Unit 1 occurs at the top of the formation and Unit 4 at the base, with all units likely to be present in the project area (a total thickness of approximately 900 m).

The Bunbury Basalt occurs discontinuously between the Yarragadee and Leederville Formations and the top of the basalt is typically highly weathered. The Bunbury Basalt is unlikely to be present at the study area, based on the literature (i.e. DWER drilling information records (DWER, 2019) and the Water Corporation Magnetic data survey (Baddock, 2005)).

3.2. Hydrogeology

The Yalyalup project is wholly located within the Busselton-Capel Groundwater Area for the Superficial and Leederville aquifers and within the Busselton-Yarragadee Groundwater Area for the Yarragadee aquifer. All these groundwater areas are covered by the South West Groundwater Areas Allocation Plan produced by DWER (DWER, 2009).

Three major aquifers have been identified within the Yoongarillup project (ordered from shallow to deep): the Superficial, Leederville and Yarragadee aquifers., each of which are described below.

3.2.1. Superficial Aquifer

The Bassendean Sand, Guildford Formation and Yoganup Formation form an unconfined Superficial aquifer, with a maximum saturated thickness of 9 m in the mine site area. The permeability of the Superficial aquifer is variable and depends on sediment type, with saturated sands having higher permeability than clays. At the project, the Yoganup Formation forms the main portion of the aquifer, while the Bassendean Sand is generally saturated when water levels rise in the wet season. The Guildford Formation is of lower permeability, owing to its more clayey nature. The high sand content in all the superficial units at the site mean they are in hydraulic connection and behave as a single aquifer unit. There is no evidence of any perched aquifer at the site.

The water table elevation slopes gently from the Whicher Scarp (i.e. ~40 mAHD) to the coast (i.e. 0 mAHD), and closely parallels the topography in a north-western direction under a low hydraulic gradient. Groundwater levels, as measured in the Superficial monitoring bores (both Doral's monitoring bores, other private users and DWER monitoring bores), are close to surface, at depths of between 0 to 4.7 mbgl (i.e 15.6 and 34.8 mAHD). At the project, low-lying areas are often waterlogged during the winter period (i.e. with the water table rising to ground surface). The seasonal water table fluctuation is less than 0.4 m close to the coast, approximately 1 to 2 m across the central part of the Swan Coastal Plain (including the mine site) and up to 2 to 4 m close to the Whicher Scarp. Peaks in the groundwater hydrographs generally occur 1 to 3 months after peaks in the rainfall and the length of the time lag increases with increasing depth to the water table. Although annual rainfall indicates a drying climate (Section 2.3), rainfall and subsequently aquifer recharge experienced in recent years is still sufficient to fill the Superficial aquifer and a long-term trend of decline in water levels due to change in climate is therefore not observed in the project area.

Recharge of groundwater to the Superficial aquifer is mostly from direct infiltration of rainfall, with some recharge occurring by upward leakage from the underlying Leederville aquifer mostly across the seaward section and from down-slope surface drainage from the Whicher Scarp (Hirschberg 1989).

Groundwater is discharged from the Superficial aquifer to the ocean and the coastal swamps, to surface drainage including rivers, streams and an extensive network of constructed drains. It is also discharged via direct evaporation from swamps and evapotranspiration from vegetation where the water table is shallow. There is also discharge of groundwater downward into the Leederville and Yarragadee aquifers where the hydraulic head gradient is downward, especially where the superficial lithology is sandy (Baddock, 2005). Owing to the very shallow water table, the loss of groundwater to the atmosphere through evapotranspiration is likely to be high (Hirschberg 1989).

Pumping from the Superficial aquifer (mainly from the Yoganup Formation) is limited and is generally associated with small farm supplies and garden reticulation.

3.2.2. Leederville Aquifer

The Leederville Formation forms a multi-layered confined aquifer system, comprising discontinuous interbedded sequences of sand, clayey sand, silt and shale. It underlies the Superficial deposits across the Yalyalup mine area, coming to surface only to the south-east of the study area, where it forms the Whicher Scarp.

At the Yalyalup mine site area, the Leederville aquifer generally comprises the Vasse Member of the Leederville Formation. The Mowen Member of the Leederville Formation, which overlies the Vasse Member is commonly considered as an aquitard due to its clayey nature. At the eastern portion of the study area, the Mowen Member is likely to be very thin or has a greater sand content.

The hydraulic permeability of the Leederville aquifer is highly variable, dependent on the amount of clay and sand beds, and the clay matrix content within the sand beds. Bulk horizontal permeability is estimated to be in the range of 0.1 to 5 m/d, with a horizontal permeability of generally 1 to 3 m/d in the sand beds (Baddock, 2005). Pumping test data conducted in the Busselton area (Baddock, 2005) show a horizontal permeability of approximately 1 m/d, which indicates a higher clay content. The Mowen Member acts as an aquiclude, with a low permeability of 0.01 m/d.

Groundwater level elevations in the Leederville aquifer reduce from an average of approximately 35 mAHD at the foot of the Whicher Scarp to approximately 2 mAHD close to the coast. The seasonal water level fluctuations are generally between 2 to 3 m. Additionally, a gradual small declining trend associated with ongoing pumping activity in the area is evident since 2003, especially in the bores screened deeper in the Leederville aquifer.

Generally, the Leederville Formation receives recharge towards the Whicher Scarp and discharges towards the coast.

Groundwater discharge from the Leederville aquifer occur into the underlying Yarragadee aquifer. However, clay layers within the Leederville Formation and shale layers of the upper unit of the Yarragadee Formation are believed to restrict vertical flow. Groundwater head gradients are upward in the north of the study area, where groundwater is discharged into the overlying Superficial Formation near the coast and offshore.

3.2.3. Yarragadee Aquifer

The Yarragadee Formation forms the confined Yarragadee aquifer below the Leederville aquifer. There are four sub-units (i.e. Units 1 to 4) within the Yarragadee Formation with distinct lithological properties. The Yarragadee Formation Unit 1 comprises the uppermost portion of the Yarragadee aquifer and is a sand unit with extensive clay layers. The underlying Yarragadee Unit 2 comprises sand with common interbedded clay that normally makes up to 40% of the unit. Unit 3 of the Yarragadee Formation is the dominant component of the aquifer present, and consists of sand with only minor clay. Yarragadee Unit 4 comprises sand and clayey sand interbedded with clay.

The permeabilities of the Yarragadee aquifer vary between each of the aquifer units. High permeability sands are present within Yarragadee Formation Units 1, 2 and 3, but are most extensive within Unit 3 (i.e. the bulk horizontal permeability of Unit 3 is estimated to be in the range of 5 to 30 m/d).

Groundwater flow through the upper part of the Yarragadee aquifer is south to southwest toward the coast. Groundwater level elevations in the Yarragadee aquifer reduce from an average of approximately 25 to 35 mAHD at the foot of the Whicher Scarp, to approximately 5 mAHD close to the coast. There is generally 4 to 5 m of average seasonal water level fluctuation evident at the study area. There is a downward potentiometric head gradient within Unit 1 and the underlying Unit 2 and then Unit 3. The greater potentiometric head differences between the units are generally where significant clay bedding is present.

The Yarragadee aquifer receives recharge by downward leakage from the Leederville Formation (Hirschberg 1989), especially in the inland areas around the Whicher Scarp, where downward heads prevail. As well as downward leakage from the Leederville Aquifer, recharge to the aquifer is likely to occur mostly from the south and south east where the formation outcrops.

A significant volume of groundwater discharge from the Yarragadee aquifer is offshore adjacent to Bunbury, where the aquifer subcrops beneath the Superficial aquifer below the sea floor. Groundwater is also discharged to the overlying Superficial and Leederville Formations adjacent to the coast.

4. BOREFIELD DESCRIPTION

At the Yalyalup mine, two production bores YA_PB01 and YA_PB02 have been screened in the Yarragadee aquifer, to supply sufficient water for the Yalyalup mining operations. Bore YA_PB01 was constructed mid-2021, however due to difficulties to supply the required volumes from the YA_PB01 bore (refer to AQ2, 2021a), Doral has recently constructed and test pumped a second Yarragadee aquifer production bore YA_PB02. Both bores have been added to the existing Yarragadee aquifer groundwater licence GWL205919(4).

The production bore locations are shown in Figure 3, while construction details for these bores are summarised in Table 4. Comprehensive data on the drilling, bore construction, test pumping and geochemistry of the Yarragadee production bores YA_PB01 and YA_PB02 are provided in the hydrogeological assessment reports AQ2 (2021a) and AQ2 (2023), respectively.

Table 4 Yarragadee Production Bore Details

Bore ID	Coordinates (MGA, ZONE 50)		Ground Elevation	Depth Cased	Top of Casing Elevation	Screened Interval	Casing Diameter
	Easting	Northing	mRL	m	mRL	mbgl	mm
YA_PB01	361182	6271638	29.0	361.7	29.39	295.7-355.7	168
YA_PB02	359067	6271714	22.0	402	22.67	298-400	168

Doral has drilled and installed 12 monitoring bores (i.e. YA_MB01S to YA_MB12S) across the proposed Yalyalup site, with 6 bores being installed in December 2017 and the remaining 6 bores in June 2019. All these monitoring bores were drilled to the base of the Superficial Formation (i.e. Yoganup Formation) and screened across the all Superficial Formation units. Additionally, five monitoring bores (YA_MB33_GDE to YA_MB37_GDE) have been drilled and constructed into the Superficial aquifer in May 2020, to allow monitoring of water level changes along the McGibbon Track, where a sensitive GDE vegetation has been identified. Water level monitoring will be conducted to establish a pre-disturbance baseline and pre-dewatering and then more frequently during active dewatering activities adjacent to this area. Locations of the existing groundwater monitoring bore network are shown in Figure 4. Details of Doral's monitoring bores are presented in Table 5.

An additional 22 existing DWER and private bores have been monitored in order to obtain the baseline groundwater monitoring data from the Superficial and Leederville aquifers (i.e. 10 Superficial and 12 Leederville monitoring bores), with their details presented in Table 6 and their locations shown in Figure 5.

It should also be noted that during the construction of the first Yarragadee production bore YA_PB01 mid-2021, a nest of four monitoring bores (YA_MB13S, YA_MB13M, YA_MB13V and YA_MB13Y) were constructed separately into the Superficial, shallow Leederville (Mowen Member), deep Leederville (Vase Member) and Yarragadee (Unit 3) aquifers, to allow monitoring of water level changes in each aquifer during mining operations (Figure 3). In 2022, Doral drilled, constructed and test pumped a second Yarragadee production bore (YA_PB02) at the Yalyalup mine that provides the required abstraction rate of 50 L/s needed for mine water supply purposes. Additionally, a nest of three monitoring bores, situated between 10 to 30 m to the east of YA_PB02, have been installed separately into the shallow Leederville, deep Leederville and Yarragadee aquifers (Figure 3). Furthermore, two existing private bores have been added to monitor water level changes on regional scale. Construction details for these monitoring bores are summarised in Table 7.

A network of surface water monitoring sites has been identified and monitored in areas adjacent to the Yalyalup mine area. Surface water monitoring sites are shown on Figure 6 and site details are summarised in Table 8.

Table 5 Yalyalup - Existing Monitoring Bore Details

Bore ID	Coordinates (MGA, Zone 50)		Ground Elevation#	Current Cased Total Depth#	Top of Casing (TOC)	TOC Elevation	PVC Casing Diameter	Screened/ Slotted Intervals	Aquifer	Status
	Easting (m)	Northing (m)	(mAHD)	(mbgl)	(mAHD	(mbgl)	(mm)	(mbgl)		
YA_MB01S	357253	6270021	23.46	5.01	24.18	0.72	50	1-7	Superficial	Current
YA_MB02S	356760	6270882	20.23	7.16	21.17	0.94	50	3-9	Superficial	Current
YA_MB03S	356989	6271678	18.76	8.66	19.22	0.46	100	1.8-7.8	Superficial	Current
YA_MB04S	357789	6270637	22.86	7.56	23.57	0.71	50	3-9	Superficial	Current
YA_MB05S	357787	6270960	21.80	7.64	22.28	0.48	100	1.5-7.5	Superficial	Current
YA_MB06S	357960	6271720	20.52	7.43	20.95	0.43	100	1.3-7.3	Superficial	Current
YA_MB07S	358606	6270858	25.04	7.26	25.83	0.79	50	2-8	Superficial	Current
YA_MB08S	358589	6271310	23.24	9.42	23.65	0.41	100	3.3-9.3	Superficial	Current
YA_MB09S	359401	6270501	30.58	7.65	31.2	0.62	50	2-8	Superficial	Current
YA_MB10S	359305	6270896	28.51	4.65	29.26	0.75	50	1-7	Superficial	Current
YA_MB11S	359295	6271545	24.69	8.22	25.14	0.45	100	1.8-7.8	Superficial	Current
YA_MB12S	359159	6271808	22.79	8.51	23.24	0.45	100	2.5-8.5	Superficial	Current
YA_MB33_GDE	358889	6271018	25.78	3.97	26.43	0.65	50	0.5-4.0	Superficial	Current
YA_MB34_GDE	358725	6271158	24.61	6.26	25.22	0.61	50	0.4-6.4	Superficial	Current
YA_MB35_GDE	358599	6271570	21.98	6.0	22.54	0.56	50	0.5-6.0	Superficial	Current
YA_MB36_GDE	359075	6270792	27.95	5.41	28.56	0.61	50	0.5-5.5	Superficial	Current
YA_MB37_GDE	359475	6271786	24.47	4.92	25.01	0.54	50	0.5-5.0	Superficial	Current

Table 6 Yalyalup - Existing Private User's Bore Details

Bore ID	Coordinates (MGA, Zone 50)		Ground Elevation	Screened Depth	Top of Casing (TOC)	Aquifer	Status
	Eastings (m)	Northings (m)	(mAHD)	(mbtoc)	(mabgl)		
YA_MB14_W	358052	6272283	20.5	3.6	0.40	Superficial	Current windmill, suitable for water levels monitoring only
YA_MB15_W	358644	6270521	25	5.5	0.50	Superficial	Current bore, suitable for water levels monitoring only
YA_MB16_W	357995	6269748	28	8.54	0.25	Superficial	Current bore, suitable for water levels monitoring only
YA_MB17_W	357282	6270170	23.5	3.7	0.01	Superficial	Current bore, suitable for water levels monitoring only
YA_MB18_W	357402	6269919	23.8	4.3	0.00	Superficial	Current bore, suitable for water levels and quality monitoring
YA_MB19_W	356737	6271639	18.1	3.8	0.10	Superficial	Current windmill, suitable for water levels monitoring only
YA_MB20_W	359000	6269832	30.5	3.4	0.10	Superficial	Current bore, suitable for water levels monitoring only
SCPD28A	358612	6271752	21.2	9	0.00	Superficial	DWER bore, suitable for water levels and quality monitoring
SCPD29A	359916	6269605	34.8	9.5	0.00	Superficial	DWER bore, suitable for water levels and quality monitoring
TS012M	358329	6270015	29.24	9	0.48	Superficial	Current bore, suitable for water levels and quality monitoring
YA_MB21_W	359572	6270576	30	17	0.25	Leederville	Defunct bore, suitable for water levels and quality monitoring
YA_MB22_L	357207	6270142	23.5	16.5	0.05	Leederville	Defunct bore, suitable for water levels and quality monitoring
YA_MB23_L	358326	6272028	20.5	42	0.10	Leederville	Current bore, suitable for water levels and quality monitoring
YA_MB24_W	357928	6271837	19.8	48	0.45	Leederville	Current windmill, suitable for water levels monitoring only
YA_MB30_W	357993	6269748	28	69	0.10	Leederville	Current bore, suitable for water levels monitoring only
YA_MB25_L	356347	6270064	22.25	70	0.10	Leederville	Current bore, suitable for water quality monitoring (pump in bore)
YA_MB26_W	356712	6271194	19.2	16	0.15	Leederville	Defunct windmill, suitable for water levels monitoring only
YA_MB27_L	357323	6269971	25	48	0.30	Leederville	Current bore, suitable for water quality monitoring (pump in bore)
YA_MB28_W	356220	6269870	23	70	0.00	Leederville	Current bore, suitable for water quality monitoring (pump in bore)
YA_MB29_W	358311	6269190	29	11	0.35	Leederville	Current bore, suitable for water quality monitoring (pump in bore)
YA_MB31_L	357996	6269745	28	25.3	0.25	Leederville	Current bore, suitable for water levels and quality monitoring
YA_MB32_L	358002	6270118	25.5	30	0.10	Leederville	Current bore, suitable for water quality monitoring (pump in bore)

Table 7 Yalyalup- Details of Existing Nest of Monitoring Bores for Yarragadee Production Bores

Bore ID	Coordinates		Depth Cased (m)	Casing Diameter (mm)	Screened Interval (m)	Top of Casing Elevation (m AHD)	Formation (Aquifer)	Comments
	Easting (m MGA)	Northing (m MGA)						
YA_MB12M	359098	6271720	26	100	306-402	23.03	Mowen Member (Leederville)	Nest of bores located approx. 10-30 m west of YA_PB02
YA_MB12V	359088	6271718	60	100	54-60	22.94	Vasse Member (Leederville)	
YA_MB12Y	359078	6271716	402	100	20-26	22.93	Yarragadee (Unit 3)	
YA_MB13S	361158	6271638	5.5	100	1-5.5	29.58	Superficial	Nest of bores located approx. 10-25 m west of YA_PB01
YA_MB13M	361162	6271638	17.5	100	11.5-17.5	29.56	Mowen Member (Leederville)	
YA_MB13V	361168	6271638	89	100	83-89	29.55	Vasse Member (Leederville)	
YA_MB13Y	361173	6271638	349	100	289-349	29.52	Yarragadee (Unit 3)	
YA_MB30_W	357993	6269748	54	100	39-54	28.10	Vasse Member (Leederville)	Regional bore
61000125 (also known as BN20Y)	358660	6273620	352	65	344-350	18.27	Yarragadee (Unit 3)	Regional bore

Table 8 Yalyalup- Details of Surface Water Monitoring Sites

Site Name	Approximate Location (GPS surveyed)			Comments
	Eastings (MGA94)	Northings (MGA94)	Elevation (mAHD)	
YALSW01	355307	6269882	23	Original Sabina River channel. Limited area surface flows ~1 km Downstream from Sabina Diversion weir.
YALSW02	356614	6269990	24	Artificial drainage flows from paddocks within Lot 421
YALSW03	357034	6270001	26	Woddidup Creek flows, semi regional, ~3.0 km x 2.0 km catchment
YALSW04	357848	6270038	23	Ag dam Lot 758. Seepage from Bassendean Sands in close proximity to proposed mining
YALSW05	359214	6270070	29	Un-named Creek, catchment estimated 2.0 km x 2.0 km
YALSW06	356099	6270231	21	Optional, alternate site if YALSW02 access is poor
YALSW07	356887	6270304	20	Farm dam
YALSW08	356081	6270852	20	Optional, alternate site if YALSW02+06 access is poor
YALSW09	357805	6270840	22	Un-named Creek/Artificial drains in centre of project
YALSW10	355520	6271611	18	Downslope sampling site for western margins of project.
YALSW11	356540	6271665	18	Woddidup Creek flows, Downslope flows from central west of project area. No Mixing with Princefield Drain
YALSW12	356866	6271676	18	Un-named Creek/Artificial drains in centre of project. No Mixing with Princefield Drain.
YALSW13	356997	6271686	18	Roadside drain Downslope flows from north east of project area.
YALSW14	358604	6271766	21	Roadside drain Downslope flows from north east of project area
YALSW15	359297	6271785	21	Proposed monitoring site – upstream of proposed “Licenced Discharge Point”

5. MONITORING REQUIREMENTS UNDER GWL206603(1)

5.1. General

The Yalyalup mine monitoring requirements for the Superficial Aquifer (dewatering) for the reporting period 1 January to 31 December 2022, are as per the current GWOS (AQ2, 2021b) and are summarised in Table 9 and outlined below.

5.2. Monitoring of Groundwater Abstraction

The active licence, GWL206603(1), allow for the total annual abstraction of up to 750,000 kL of groundwater from the Superficial aquifer. A totalising (cumulative) flow meter will be installed at each active in-pit.

To prevent the exceedance of the Superficial aquifer annual allocation limit, a warning trigger level has been set when the cumulative abstraction reaches 80% of the annual allocation limit.

5.3. Monitoring of Off-Site Discharge Water

In the event of all water storages being at their full capacities and prolonged heavy rainfall occurs within the pit catchment area, then excess water would be discharged off-site site via controlled “Licensed Discharge Point” (located at the eastern end of Lot 1293/3752 on Princefield Road within the Development Envelope), as shown on Figure 5.

In extreme cases (during extreme rainfall events), excess water would be able to be discharged off the mine site via the “Emergency Discharge Point”, located in the north western corner of the Development Envelope, as indicated on Figure 5. The discharged water will be connected to the existing roadside drain along the Princefield Road.

A V-notch flow metering gauge is installed at the Licenced Discharge point W1 and a pump with a flow meter is installed at the Emergency Discharge location E2.

During discharge periods, monitoring of discharge volumes are required to be undertaken daily.

5.4. Monitoring of Groundwater Levels

Monitoring of groundwater levels under the Superficial aquifer (dewatering) licence GWL206603(1) take place at 34 monitoring bores, installed into the Superficial (28) and Leederville (6) aquifers. According to the requirements listed in Table 9, groundwater levels should be recorded monthly in all monitoring bores.

Additionally, water level triggers have been set at the five GDE monitoring bores, adjacent to the environmental sensitive area (i.e. McGibbon Track), where potential direct and/or indirect impacts to vegetation from the Yalyalup dewatering operations have been identified. According to the GDE Management Plan (AQ2, 2020c), the following trigger-response mechanism will be used:

- The commencement of dewatering adjacent to the McGibbon Track will trigger increased groundwater monitoring frequency (from monthly to weekly).
- If total groundwater level decline subsequently reaches 0.25 m below the average low annual measured water level (i.e. below the typical autumn groundwater level), then supplementation will be triggered.
- If the rate of decline continues at more than 1.5 cm per week, then supplementation will be triggered.

Table 9 Yalyalup- Monitoring Requirements for Superficial Aquifer (Dewatering Operation)

Monitoring Aspect	Monitoring Site Type	Monitoring Site ID	Monitoring Data Requirement	Monitoring Frequency
Monitoring Bores	Superficial aquifer	YA_MB01S to YA_MB12S, TS012M, SCPD28A, SCPD29A	Water levels	Monthly
			Field Water Quality: pH, Eh, EC, Temp, TTA, Total Alkalinity	Monthly (field)
			Laboratory Water Quality Analysis: pH, EC, TDS, Total Acidity, Total Alkalinity, Na, Cl, SO4, Al* (dissolved), Fe (dissolved), Mn (dissolved)	Monthly (lab) (or weekly if pHF<4)
		YA_MB08S, YA_MB11S, YA_MB12S and SCPD28A	Additional Laboratory Water Quality Analysis: Total Al, • Total As, Total Cd, Total Cr, Total Co, Total Cu, Total Fe, Total Hg, Total Ni, Total Se, Total Tl, Total U, Total Zn, Ra226, Ra228	Six-monthly (lab)
		GDE monitoring bores (YA_MB33_GDE to YA_MB37_GDE)	Water levels	Monthly (during baseline and pre-dewatering) and Weekly (during active adjacent dewatering)
		YA_MB14_W, YA_MB15_W, YA_MB16_W, YA_MB19_W, YA_MB20_W	Water levels	Monthly
		YA_MB18_W	Water levels	Monthly
			Field Water Quality: pH, Eh, EC, Temp, TTA, Total Alkalinity	Quarterly (field)
			Laboratory Water Quality Analysis: pH, EC, TDS, Total Acidity, Total Alkalinity, Na, Cl, SO4, Al* (dissolved), Fe (dissolved), Mn (dissolved)	Quarterly (lab) (or weekly if pHF<4)
	Leederville aquifer (Mowen Member)	YA_MB21_W, YA_MB22_L, YA_MB23_L, YA_MB24_W, YA_MB26_W, YA_MB31_L	Water levels	Monthly
		YA_MB21_W, YA_MB22_L, YA_MB23_L, YA_MB25_L, YA_MB27_L, YA_MB28_W, YA_MB29_W, YA_MB31_L, YA_MB32_L	Field Water Quality: pH, Eh, EC, Temp, TTA, Total Alkalinity	Quarterly (field) (Sept/Dec/March/ June)
			Laboratory Water Quality Analysis: pH, EC, TDS, Total Acidity, Total Alkalinity, Na, Cl, SO4, Al* (dissolved), Fe (dissolved), Mn (dissolved)	Quarterly (lab) (or weekly if daily pHF<4)

* if dissolved Al > 1 mg/L then additional analyses are required for Zn, Cr, Cu, Mg, Ni, Cd, Se, As, Pb and Hg

Table 9 (cont.) Yalyalup - Monitoring Requirements for Superficial Aquifer (Dewatering Operation)

Monitoring Aspect	Monitoring Site Type	Monitoring Site ID	Monitoring Data Requirement	Monitoring Frequency
Surface Water	Surface water sampling location	YALSW01 to YALSW14 Proposed YALSW15	Field Water Quality: pH, EC	Monthly when flowing
			Laboratory Water Quality Analysis: pH, EC, TDS, TSS, Total acidity, SO4	Monthly when flowing
Pit dewatering quality	Pit dewatering discharge point	Pit dewatering discharge point	Pit dewatering volume	Weekly
			Field Water Quality: pH, Eh, EC, Temp, TTA, Total Alkalinity	3 times a week (M, W, F) (field)
			Laboratory Water Quality Analysis: pH, EC, TDS, Total Acidity, Total Alkalinity, Na, Cl, SO4, Al* (dissolved), Fe (dissolved), Mn (dissolved)	Monthly (lab) (or weekly if daily pHF<4)
Process Water Dam	Surface water sampling location	PWD sampling point	Field Water Quality: pH, Eh, EC, Temp, TTA, Total Alkalinity	3 times a week (M, W, F) (field)
			Laboratory Water Quality Analysis: pH, EC, TDS, Total Acidity, Total Alkalinity, Na, Cl, SO4, Al* (dissolved), Fe (dissolved), Mn (dissolved)	Monthly (lab)
			Additional Laboratory Water Quality Analysis: Total Al, • Total As, Total Cd, Total Cr, Total Co, Total Cu, Total Fe, Total Hg, Total Ni, Total Se, Total Tl, Total U, Total Zn, Ra226, Ra228	Six-monthly (lab)
Off-site discharge	Surface water sampling location	Licenced discharge point, Emergency Discharge Points	Off-site discharge volume	Daily when in use
			Field Water Quality: pH, EC, TTA, TSS	On the 1st day of discharge then 3 times a week during discharge
			Laboratory Water Quality Analysis: pH, EC, TDS, TSS, Total acidity, Total Alkalinity, Total hardness, Cl, SO4, Al* (dissolved), Fe (dissolved), Mn (dissolved)	On the 1st day of discharge then monthly during discharge

5.5. Monitoring of Water Chemistry

5.5.1. Pit Dewatering Chemistry

According to the superficial licence requirements listed in Table 9, analysis of field parameters is required three times a week (Monday, Wednesday and Friday) when dewatering is taking place, with monthly laboratory analysis of the pit dewatering chemistry. If field pH <4, the frequency of laboratory analysis must increase to weekly.

Default trigger values for the chemistry of the pit water being abstracted, have been specified in the GWOS and are summarised in Table 10.

Table 10 Pit Dewatering Water Chemistry Default Trigger Values

Pit Dewatering Water Parameter	Trigger Criteria
pH*	<5.5
Chloride: Sulphate ratio, or Sulphate: Chloride ratio#	<2, or >0.5
TTA	>40 $mgCaCO_3/L$
Total alkalinity	<30 $mgCaCO_3/L$
Dissolved Aluminium#	>1 mg/L

* values were taken from the DER ASS guideline (DER, 2015);
# values as advised by Regional DWER

If dissolved Al concentration exceeds 1 mg/L for any laboratory test, then the sample must be analysed further for As, Cd, Cr, Cu, Pb, Hg, Ni, Se and Zn. If total $alkalinity_{FIELD}$ (as $CaCO_3$) <30 mg/L, Doral will review the data available to determine whether there is a Downward trend in total alkalinity and pH or a corresponding upward trend in filtered Al, Fe, Mn and SO_4.

5.5.2. PWD Dewatering Chemistry

The Process Water Pond (PWD) should be sampled monthly for field and laboratory analysis, as listed in Table 9. Additional laboratory analysis (total metals and radium, Table 9) are required six-monthly.

PWD water default trigger values have been specified in the GWOS and are provided in Table 12.

Table 11 PWD Water Chemistry Default Trigger Values

PWD Water Parameter	Trigger Criteria
pH	<5.5
TTA	>40 $mgCaCO_3/L$
Total alkalinity	<30 $mgCaCO_3/L$
Dissolved Aluminium#	>1 mg/L

If dissolved Al concentration exceeds 1 mg/L for any laboratory test, then the sample must be analysed further for As, Cd, Cr, Cu, Pb, Hg, Ni, Se and Zn.

5.5.3. Groundwater Chemistry

Local Superficial and shallow Leederville (Mowen Member) monitoring bores are sampled monthly, with field measurements and laboratory analyses conducted on the sampled water. Only quarterly field and laboratory water quality monitoring is necessary for regional Superficial monitoring bore YA_MB18_W and selected Leederville monitoring bores. If the field pH in any monitoring bore is less than 4, the frequency of laboratory analyses must increase to weekly (Table 9).

Additional laboratory analysis (total metals and radium, Table 9) are required in four monitoring bores (YA_MB08S, YA_MB11S, YA_MB12S and SCPD28A) on six-monthly basis.

Groundwater default trigger values from all local Superficial and Leederville (Mowen Member) monitoring bores have been defined in the GWOS and are summarised in Table 12.

It should be noted that groundwater chemistry site-specific trigger values have been developed for each of the Superficial aquifer groundwater monitoring bores, by comparing baseline data to DWER guideline values as advised by regional DWER office. The bore specific chemical triggers have been determined using background data and were based on the mean +/- 2x standard deviations of the background set.

If dissolved Al concentration exceeds 1 mg/L for any laboratory test, then the sample must be analysed further for As, Cd, Cr, Cu, Pb, Hg, Ni, Se and Zn.

5.5.4. Off-Site Discharge Water Chemistry

The chemistry of off-site discharge water is to be tested on samples obtained at two monitoring locations (Licensed Discharge Point and Emergency Discharge Point). Field water quality parameters are to be measured on the first day of discharge, then three times per week while discharge continues. Laboratory analyses are to be carried out on samples obtained on the first day of discharge and then monthly thereafter (Table 9).

Trigger values for the discharge water sent off-site, are as set in accordance with the DWER discharge licence conditions, and are as follows:

- pH - 5.5 – 9.0
- TSS – 80 mg/L
- TDS – 2,500 mg/L
- TTA – 40 mg/L.

5.5.5. Surface Water Chemistry

Monthly field and laboratory measurement and analysis of surface water chemistry are to be sampled from selected surface water locations when surface water flows occur (Table 9).

Table 12 Groundwater Chemistry Bore Specific Trigger Values

Bore ID	SWL (mbtoc)	Parameter											
		Field pH	Field Total alkalinity (mg/L)	Sulphate: Chloride ratio	Chloride: Sulphate ratio	Dissolved Aluminium (mg/L)	Field Total acidity (mg/L)	Field Electrical Conductivity (uS/cm)	Total Dissolved Solids (mg/L TDS)	Sulphate (mg/L)	Chloride (mg/L)	Dissolved Iron (mg/L)	Dissolved Manganese (mg/L)
DWER Default Triggers	> Any baseline value	<5	<10	>0.5	<2	>1	> Any baseline value PLUS Cl: SO_4 Ratio OR All Trigger						
YA_MB01S	>4.16	<5	<35.11	>0.5	<0.84	>1	>150.43	>2,306.20	>1,184	>157.20	>576.88	>11.43	>0.32
YA_MB02S	>3.18	<5	<24.95	>0.5	<2	>1	>221.17	>2,161.99	>1,092.40	>120.06	>569.68	>25.62	>067
YA_MB03S	>2.35	<5	<39.50	>0.5	<2	>1	>210.95	>2,236.96	>1,086.26	>96.42	>602.45	>29.87	>0.90
YA_MB04S	>2.80	<5	<25.39	>0.5	<2	>1	>174.79	>1,699.30	>851.70	>44.77	>435.48	>13.04	>0.25
YA_MB05S	>1.81	<5	<15.06	>0.5	<2	>1	>87.52	>1,096.73	>528.29	>45.42	>248.37	>1.89	>0.06
YA_MB06S	>2.65	<5	<55.07	>0.5	<2	>1	>69.65	>11,940.73	>7,553.63	>634.46	>3,940.53	>3.64	>0.40
YA_MB07S	>4.37	<5	<7.78	>0.53	<1.54	>1	>63.22	>521.24	>252.54	>30.27	>95.38	>0.27	>0.02
YA_MB08S	>2.32	<5	<15.37	>0.5	<2	>1	>56.45	>671.40	>291.03	>39.22	>130.28	>0.47	>0.02
YA_MB09S	>4.47	<5	<32.72	>0.5	<1.34	>1	>114.71	>3,259.95	>1,638.33	>190.83	>858.47	>1.62	>0.03
YA_MB10S	>2.93	<5	<23.27	>0.5	<1.22	>1	>99.68	>1,932.48	>1,034.23	>159.93	>598.76	>4.62	>0.03
YA_MB11S	>2.04	<5	<46.48	>0.5	<2	>1	>129.59	>3,943.12	>2,013.80	>172.19	>1,177.81	>11.11	>0.66
YA_MB12S	>0.56	<5	<53.64	>0.5	<2	>1	>262.48	>1,994.23	>1,021.12	>58.34	>529.35	>33.94	>1.08
SCPD28A	>1.92	<5	<42.48	>0.5	<2	>1	>137.34	>4,205.06	>4,078.27	>1,258.72	>1,258.72	>3.18	>0.28
SCPD29A	>1.48	<5	<26.19	>0.5	<2	>1	>250.90	>1,143.21	>535.07	>30.30	>274.71	>7.93	>0.15
TS012M	>4.28	<5	<41.66	>0.64	<0.75	>1	>268.64	>2,375.82	>1,310.69	>259.19	>597.36	>22.43	>0.06
YA_MB18_W	>3.34	<5	<6.99	>0.84	ND#	>1	>133.75	>1,655.55	>896.76	>181.79	>357.70	>0.28	>0.40

ND – not determined due to high variability in the dataset (i.e. values are far from the mean)

6. 2022 YALYALUP MINE SITE ACTIVITIES

Mining activities at Yalyalup commenced in Q4 2021, starting with topsoil clearing and road construction.

During the first quarter (Q1) of 2022, the following civil works and construction were completed:

- Feed Preparation plant
- Wet Concentrator
- Vasse River bridge crossing
- Process Water Dam/ Drop out Dam

Additionally, pre-mining and stockpiling of first ore commenced in Q1 2022.

During 2022, there were 22 active mine pits, with dewatering commencement in February. The pits were generally excavated to shallow depths (i.e. Ore 1, Bassendean sand), with only five pits excavated to deep ore in Yoganup Formation (the base of the Superficial Formation). Backfilling of pit voids with waste clay and sand materials started approximately one month after mining was completed. The pit excavation schedule is summarised in Table 13 and the site infrastructure and pits where ore was mined in 2022, are shown in Figure 7.

During the reporting period, dust controls were maintained throughout the construction period by the regular use of water carts.

Table 13 2022 Yalyalup Pit Excavation Schedule Summary

Mining Block/Date	Jan22	Feb22	Mar22	Apr22	May22	Jun22	Jul22	Aug22	Sep22	Oct22	Nov22	Dec22
Block 53												
Block 57												
Block 62												
Block 63												
Block 64												
Block 65												
Block 69												
Block 70												
Block 71												
Block 72												
Block 73												
Block 74												
Block 75												
Block 76												
Block 77												
Block 78												
Block 79												
Block 80												
Block 81												
Block 82												
Block 87												
Block 88												
Block 89												
Block 91												
Block 92												

Mining shallow ore (Bassendean Sand)
Mining deep ore (Yoganup Formation)

7. MONITORING RESULTS

7.1. Groundwater Abstraction

Groundwater abstraction volumes were recorded in accordance with the current GWOS. Total annual and monthly abstraction volumes from the Superficial aquifer under GWL206603(1) recorded over the 2022 review period are presented in Tables 14 and 15 and are shown in Figure 8.

Table 14 Summary of Annual Groundwater Abstraction 2022

Aquifer	Groundwater Well Licence	Allocation Limit (kL/annum)	2022	
			Abstraction (kL)	Allocation Used (%)
Superficial	GWL206603(1)	750,000	476,742	63.6

Over the review period, dewatering was required in eight active pits (Blocks 69, 70, 71, 72, 78, 81, 91 and 92, as per Table 15), except for Block 64, where Feed Prep is located. There is a drain (2 m deep) built around this Feed Prep area (Block 64) to capture any run off. It was observed that groundwater feeds into this drain most of the year.

During 2022, abstraction volumes from each active pit (block) that required dewatering, were calculated based on totalising flow meters installed at each dewatering pump or were estimated based on pump work hours, due to a lack of available flow meters.

Table 15 Monthly Groundwater Abstraction for 2022

Aquifer	Superficial Abstraction (Dewatering)									
Month	Block 64	Block 69	Block 70	Block 71	Block 72	Block 78	Block 81	Block 91	Block 92	Total Monthly Abstraction (kL)
Jan-22	4,842	0	0	0	0	5,469	0	0	556	10,867
Feb-22	4,059	0	0	1,272	0	1,648	0	939	0	7,918
Mar-22	4,310	0	0	0	0	0	0	17,616	0	21,926
Apr-22	4,704	0	0	0	0	0	0	0	0	4,704
May-22	30,048	28,594	0	0	0	0	0	0	0	58,642
Jun-22	52,080	50,496	0	0	0	0	0	0	0	102,576
Jul-22	20,052	40,153	0	0	0	0	0	0	0	60,205
Aug-22	45,696	24,481	0	0	0	0	0	0	0	70,177
Sept-22	8,687	16,413	0	0	0	0	0	0	0	25,100
Oct-22	5,841	0	21,775	0	0	0	0	0	0	27,616
Nov-22	1,310	0	51,055	0	0	0	0	0	0	52,365
Dec-22	1,035	0	27,168	0	5,963	0	480	0	0	34,646
Total 2022 (kL):	182,664	160,137	99,998	1,272	5,963	7,117	480	18,555	556	476,742

Over the review period, a total of 476,742 kL was abstracted from the Superficial aquifer under GWL206603(1), corresponding to 63.6% of the annual entitlement of 750,000 kL.

It should be noted that this reported total abstraction includes direct rainfall into the open active pit and a volume of stormwater directed to the active pit dewatering sump. Also included in the total abstraction volumes is return water from tails, which was collected and abstracted while mining adjacent pits (downhill). In summary, the total volume of water abstracted from active pits in 2022 is greater than the volume of groundwater removed from the Superficial aquifer, but is still approximately 36% below the annual allocation.

The highest monthly volumes abstracted from the Superficial aquifer were recorded in June 2022 (102,576 kL).

The highest water abstraction volume in 2022 was recorded from Block 64 (182,664 kL, equivalent to 38.3% of the total Superficial abstraction), with Blocks 69 and 70 contributing 33.6% and 21% of the total abstraction volume, respectively.

7.2. Off-Site Water Discharge

During the 2022 reporting period, excess water across the Yalyalup mine site was discharged off-site via Licenced Discharge Point (W1) and Emergency Discharge Point (E2). Additionally, emergency Discharge Points E1 were not used in 2022.

Total monthly off-site water discharge is summarised in Table 16 and shown in Figure 8.

Table 16 Monthly Off-Site Water Discharge for 2022

Month	Licenced Discharge Point W1 (kL)	Emergency Discharge Point E1 (kL)	Emergency Discharge Point E2 (kL)	Total Monthly Discharge (kL)
Jan-22	0	0	0	0
Feb-22	0	0	0	0
Mar-22	0	0	0	0
Apr-22	0	0	0	0
May-22	0	0	0	0
Jun-22	63	0	0	63
Jul-22	24,706	0	0	24,706
Aug-22	65,613	0	135,973	201,586
Sept-22	2,939	0	2,510	5,449
Oct-22	11,116	0	4,726	15,842
Nov-22	8,273	0	0	8,273
Dec-22	0	0	0	0
Total 2022 (kL):	112,709	0	143,209	255,918

During the 2022 reporting period, a total of 255,918 kL of excess water was calculated to have been discharged off-site. Numerous discharge events took place, due to stormwater generated after heavy rainfall events or build-ups of tailings return water. The highest total monthly discharged volume in 2022 was recorded in August 2022 (201,586 kL), which is approximately 78% of the total discharge volume.

It should be noted that the discharge volumes from the Licensed Discharge Point (W1) located at the PWD were measured using a V-notch weir (as per GWOS). A total of 112,709 kL was discharged through the Licenced Discharge Point W1, with the remaining (143,209 kL) being discharged via Emergency Discharge Point E1. Unfortunately, discharged volumes from E1 were not metered between 9th and 18th August 2022, when discharge volumes were estimated based upon the approximate area of the catchment, rainfall for this period and the average flow rate of two pumps running continuously for 9 days. Since then, the emergency discharge at E2 has been metered.

7.3. Groundwater Levels

Hydrographs of the historical and 2022 data for the Yalyalup mine have been plotted and are presented as follows:

- Figures 9 and 11: Superficial aquifer bores.
- Figures 12 and 13: Leederville aquifer bores.

Groundwater level data from the monitoring bores are presented in Appendix C as follows:

- Monthly water levels as metres below top of casing (mbtoc).
- Monthly water levels as metres above Australian Height Datum (mAHD).

7.3.1. Superficial Aquifer Water Levels

The water level hydrographs in Figures 9 to 11, representing monitoring bores screened in the Superficial formation, indicate the following:

- Pre-mining groundwater levels in the Superficial aquifer across the proposed mining area ranged between 15.3 and 34.8 mAHD (i.e. 0 to 4.7 mbgl), with the highest water level elevations being recorded in August or September and the lowest in May or June.
- Seasonal cycles of water table variations associated with the winter-dominated rainfall recharge to the aquifer are evident. The seasonal water level variations for these bores were between 1.3 and 2.9 m, averaging 2 m. Variations in water levels can usually be correlated with variations in rainfall.
- Water levels across the site slope in a north-western direction under a low hydraulic gradient, which closely reflects the site topography (which is consistent with the regional flow direction, generally towards the coast).
- During the 2022 review year, the majority of the monitored bores (except for five bores YA_MB05S, YA_MB11S, YA_MB12S, YA_MB35_GDE and YA_MB37_GDE) continue to show seasonal groundwater trends and were within the range of recorded water levels. Water level elevations ranged from 15.7 to 34.5 mAHD, with their highest elevations in August or September 2022 and their lowest in May 2022. There were no noticeable declines in water levels in the majority of monitoring bores during 2022 that could be related to any mining activities.
- In 2022, bore YA_MB05S, located in the central part of the mine, south of active blocks 64, 69 and 70, has shown a declining trend of water levels from March to December (from 19.6 to 21 mAHD), likely to be related to mine activities (dewatering). Overall, a maximum water level variation of 1.4 m was recorded in 2022, however only 0.55 m could be related to dewatering (i.e. between seasonal low of 2.12 mbtoc in May 2022 and unseasonal low of 2.67 mbtoc in November 2022).

- Groundwater elevations at bores YA_MB11S and YA_MB37_GDE, located on the north western side of the mine, near to the Admin area and upstream of blocks 91 and 92, ranged between 22.4 and 24.5 mAHD (i.e. 0.6 and 2.7 mbtoc) for YA_MB11S (Figure 9a) and between 22.6 mAHD and 24.3 mAHD (0.67 and 2.4 mbtoc) for YA_MB27_GDE (Figure 9c) over 2022. There were unseasonal minor variations in water levels recorded between January and March 2022, with maximum unseasonal water level reductions of 0.85 m (YA_MB37_GDE) to 1 m (YA_MB11S) observed, likely associated with mining nearby blocks 91 and 92. Since mining of blocks 91 and 92 ceased in April 2022, water levels in both bores started to recover reaching their highs in August/September 2022 and then have gradually declined following the seasonal groundwater trend.
- Bore YA_MB12S, located in the north east corner of the site, downgradient from active block 92, showed a sharp 3 m drop in water levels from 22.8 mAHD (0.44 mbtoc) in January 2022 to 19.8 mAHD (3.46 mbtoc) in February 2022, associated with deep ore mining and dewatering of nearby block 92 in a short period of time (Figure 9a). It should be noted that Process Water Dam (PWD) and Drop Out Dam (DOD) were constructed at block 92. Since April 2022 water levels started to recover reaching their peak in August 2022 (22.94 mAHD) and then have gradually declined following the seasonal variations.
- Groundwater elevations at bore YA_MB35_GDE, located at the northern part of McGibbon Track (with sensitive vegetation) and adjacent to block 91, sharply declined (by 2.6 m) from 20.4 mAHD in February 2022 to 17.8 mAHD in April 2022, owing to deep ore mining and dewatering of block 91. Since June 2022 water levels recovered quickly due to backfilling of tails in this mine block and then have remained stable, within the pre-mining levels and minor seasonal fluctuations. It should be noted that no drawdowns have been observed in nearby upgradient bore YA_MB08S and downgradient bore SCPD28A (Figure 9c), showing a localised impact on the Superficial aquifer.
- In 2022, water level triggers set at five GDE monitoring bores were breached at the two bores, YA_MB35_GDE and YA_MB37_GDE. Water level monitoring has increased from monthly to weekly in all GDE bores, with pressure transducers installed at all bores on 28 March 2022, which are taking readings four times a day (every 6 hours). Additionally, as outlined in Section 5.4.4, the supplementation scheme was initiated in February and March 2022 (i.e. a total of 72,000 L of clean water was irrigated along the McGibbon Track using water carting).
- Bore YA_MB14_W recorded a water level variation of up to 2.6 m between August and December 2022 as a response to pumping in this bore.

7.3.2. Leederville Aquifer Water Levels

The water level hydrographs in Figures 12 and 13, represent monitoring bores screened in the Leederville Formation and indicate the following:

- Pre-mining groundwater levels in the Leederville aquifer across the proposed mining area ranged between 17.5 and 29.9 mAHD (i.e. 0 to 3.3 mbtoc), with the highest water level elevations being recorded in September and the lowest in April and May. The seasonal water level fluctuation was between 2 to 2.5 m.
- Bores YA_MB31_L, YA_MB30_W and YA_MB23_L recorded water level variations of up to 7.5 m as a response to pumping in these bores.
- Groundwater levels in the Leederville aquifer tend to decrease towards the north-west, which is consistent with the regional groundwater flow direction generally towards the coast.
- During the 2022 review year, the majority of the monitoring bores did not record any changes to the historical trend and were within the historical range of values. Water levels were generally at their lowest between April 2022 and their highest in October 2022, gradually declining afterwards.
- Bores YA_MB31_L, YA_MB30_W and YA_MB23_L showed abstraction effects, with their lowest water levels recorded in March 2022, consistent with previous years.

7.4. Groundwater Quality

Groundwater samples from the monitoring bores under GWL206603(1) at the Yalyalup mine were analysed for parameters as required by the current GWOS amendment and as summarised in Table 9. Field testing was carried out at the time of sample collection for laboratory analysis. The field and laboratory test result data for the monitoring bores are presented in tabulated form in Appendix D and plotted in Figures 14 to 34.

7.4.1. Superficial Aquifer Water Quality

Plots of the historical field and laboratory chemistry data for the Superficial aquifer have been prepared and are presented as Figures 14 to 25. The field and laboratory chemistry data show the following:

- pH: Pre-mining groundwater at monitoring bores was mostly acidic to slightly acidic (Figure 14), with field pH values ranging from 5.2 (YA_MB07S) to 7.1 (YA_MB18_W); but generally, pH was between 5.4 and 6. Lower values of pH were normally recorded in summer periods and higher values in winter periods. During 2022, field pH ranged between 5.3 (YA_MB05S) to 6.9 (YA_MB18_W) and these values were within the historical range and remained relatively steady in most of the bores, except for YMB05S. There has been a slight increasing trend in pH evident in YMB05S since July 2022, which corresponds to the rising water level trend evident in this bore (related to nearby pits mining activities). No exceedance of the pH trigger (as per Table 12) occurred in any of the monitoring bores during 2022.
- Field Electrical Conductivity (EC): Pre-mining field EC concentrations ranged between 390 µS/cm (YA_MB07S) and 11,750 µS/cm (YA_MB03S), but were generally below 2,500 µS/cm. The only exceptions were bores SCPD28A, YA_MB03S, YAMB6S and YA_MB11S, where EC concentrations ranged between 2,000 and 11,750 µS/cm. The reasons for elevated EC concentrations in these bores are unknown, however it could be associated with the existing roadside drain along the Princefield Road that runs near to these bores. During 2022, field EC concentrations ranged between 510 and 9,100 µS/cm, but were mostly less than 2,000 µS/cm, with typical steady trends. Only two bores, YA_MB03S and YA_MB06S, have shown increasing and decreasing trends, respectively since August 2022, owing to mining activities (backfilling of mine pit voids with co-disposed sand tails that contain water with higher or lower salinity, respectively than the local groundwater at these bores).
- Laboratory Total Dissolved Solids (TDS): Pre-mining field TDS concentrations ranged between 190 mg/L (YA_MB07S) and 2,200 mg/L (YA_MB03S), but were generally below 1,200 mg/L, indicating groundwater being generally fresh to marginal. The only exceptions are bores SCPD28A, YA_MB03S, YAMB6S and YA_MB11S, where TDS concentrations range from 1,400 and 5,900 mg/L, i.e. being brackish. Laboratory TDS concentrations were typically less than 1,100 mg/L at almost all monitoring locations during the review period (Figure 24). Generally, the salinities recorded in most bores during the review period fall within the range of previous values, with no clear long-term trends evident, except for bore YA_MB05S and YA_MB06S. The salinities at YA_MB05S and YA_MB06S, similar to the field EC values, had the short-term increasing and decreasing trends, respectively in 2022, owing to mining activities.
- Total Alkalinity: Total alkalinity concentrations ranged from 8 to 180 mg/L (Figure 20), were generally below 80 mg/L and were within the historical ranges, with no evidence of trends. The only exception was bore YA_MB05S, which has had an increasing trend since June 2022. During the 2022 review period, the majority of monitoring bores had field total alkalinity concentrations below the specific trigger values, as per Table 12. The only exception is bore YA_MB06S, where field total alkalinity concentrations (48 to 55 mg/L) came close to the specific trigger level of <55.07 mg/L.

- Total Acidity: Total acidity values ranged from 10 to 170 mg/L during the 2022 review period (generally below 100 mg/L at most monitoring bores, Figure 21) and were within the historical range, with no clear long-term trend. During the 2022 review period, nine monitoring bores (YA_MB01S, YA_MB03S, YA_MB04S, YA_MB05S, YA_MB08S, YA_MB09S, YA_MB10S, YA_MB11S and YA_MB12S) had more than one field total acidity (TTA) reading concentration above the specific trigger values, as per Table 12. The reasons for the elevated field TTA are unknown, especially in the bores (YA_MB01S, YA_MB04S, YA_MB09S, YA_MB10S) which are located upgradient and further away from any mining activities (pit dewatering or backfilling).
- Chloride (Cl): Chloride concentrations generally ranged from 100 to 3,320 mg/L and were generally below 1,200 mg/L, during 2022 (Figure 24). All concentrations were within the historical ranges, with no clear long-term trend, except for YA_MB05S (slightly increasing trend from August 2022) and YA_MB06S (decreasing trend from July 2022).
- Sulphate (SO_4): The groundwater sulphate concentrations ranged between 12 and 560 mg/L, generally below 200 mg/L, during the review period and were within historical ranges, with no long-term trends evident (Figure 24), except for YA_MB05S (slightly increasing trend from August 2022) and YA_MB06S (decreasing trend from July 2022).
- Sulphate: Chloride (SO_4:Cl) Ratio: The SO_4:Cl ratio ranged from 0.1 to 0.4 in the monitoring bores during the 2022 review period and was within the historical range of values and generally showed a steady trend (Figures 23 and 24). No exceedance of the default trigger level (i.e. greater than 0.5) or the specific trigger level (as per Table 12) occurred in the majority of the bores during 2022, except for TS012M and YA_MB10S, which are both located upstream and further away from the active mining area. However, the exceedance of trigger levels has been noticed since April 2021 in TS012M and October 2021 in YA_MB10S, well before mining activities (pit dewatering and backfilling) commenced in early 2022.
- Manganese (Mn): Manganese concentrations at most monitoring bores were less than 0.8 mg/L (Figure 24), which were within the historical ranges.
- Iron (Fe): Iron concentrations at most monitoring bores were slightly elevated (up to 32 mg/L, Figure 25), but were within the historical ranges.
- Aluminium (Al): Aluminium concentrations typically remained less than 0.1 mg/L at all monitoring bores (Figure 25), with some one-off spikes up to 0.45 mg/L. No exceedance of the default trigger level occurred in any of the bores during 2022.

7.4.2. Leederville Aquifer Water Quality

Field and laboratory chemical testing was carried out on water samples obtained from the monitoring bores screened in the shallow Leederville aquifer during the 2022 review period. The results are tabulated in Appendix D and plotted in Figures 26 to 28.

The 2022 field and laboratory test results indicate the following:

- pH: Groundwater at all monitoring bores was acidic to slightly acidic, during the review period (Figure 26), with field pH values ranging from 5.3 (YA_MB22_L) to 6.5 (YA_MB23_L). These pH values are within the historical ranges and remained relatively steady with no evidence of any trends.
- Field EC: Field EC ranged from 590 µS/cm (YA_MB31_L) to 2,420 µS/cm (YA_MB22_L) in the mining area (Figure 26). The data showed a relatively steady trend in most of the monitoring bores throughout 2022, remaining within the historical ranges.
- TDS: Laboratory TDS concentrations ranged from 130 to 1,200 mg/L during the review period, indicating water being fresh to marginal and were within the historical ranges for most monitoring bores (Figure28).

- Total Acidity: Total acidity values ranged from 10 to 150 mg/L during the review period (Figure 27). These values were within the historical ranges and appear to be showing a steady trend.
- Total Alkalinity: Total alkalinity concentrations ranged from 15 to 98 mg/L, all values were within the historical ranges and there were no evident long-term trends (Figure 27).
- SO_4:Cl Ratio: The SO_4:Cl ratio was below 0.2 in all monitoring bores during the review period and was within the historical range of values and generally steady (Figure 27).
- Manganese: Manganese concentrations were typically less than 0.87 mg/L, with no evident trend.
- Iron: Iron concentrations at most monitoring bores were less than 40 mg/L, within historical ranges.
- Aluminium: Aluminium concentrations typically remained at less than 0.07 mg/L at all monitoring bores. No exceedance of the default trigger level occurred in any of the bores during 2022.

7.5. Dewatering Water Quality

Mine dewatering commenced in January 2022 and continued throughout the year The results of field and laboratory water quality are presented in Figures 30 and 31 and tabulated in Appendix E.

The 2022 field and laboratory results are summarised as follows:

- Field pH was in the range 5.15 to 8.9, generally between 6 and 8, being slightly acidic to slightly alkaline.
- Field EC was in the range 940 to 5,190 uS/cm; generally between 1,000 and 3,000 uS/cm.
- Field Total Titratable Acidity (TTA) was 5 to 55 mg/L, generally less than 30 mg/L.
- Field Alkalinity was 6 to 150 mg/L.
- Field Potential Redox (Eh) was 120 to 425 OPR mV.
- TDS concentrations ranged between 550 and 2,000 mg/L.
- Total Acidity was below 28 mg/L and Total Alkalinity was below 160 mg/L.
- SO_4:Cl ratio was less than 0.86.
- Iron concentrations were generally below 1.5 mg/L, with a one-off spike of 11 mg/L.
- Aluminium concentrations were below 0.18 mg/L.
- Manganese concentrations were low (generally below 0.008 mg/L, with some one-off spikes up to 0.37 mg/L).

Generally, the dewatering water discharged from the mining pits was of similar quality to the Superficial aquifer water chemistry, with some water quality variations as a result of mixing of the groundwater with rainwater. There were short term exceedances of the trigger levels (as per Table 10) of pH, field TTA, field total alkalinity and sulphate: chloride ratio occurred in the pit dewatering during 2022. However, these exceedances were short in duration.

7.6. Process Water Dam Quality

The PWD provides the main water storage from which all process water demands are sourced. The main inputs of water into the PWD over the 2022 review period included:

- Abstraction from production bore YA_PB01, screened in the Yarragadee aquifer.
- Mine dewatering from active mine pits in 2022 (pit inflows).
- Recycled process water (water returned from co-disposed sand tails).
- Runoff from impervious areas of the site such as roads, buildings/structures and hardstands.
- Direct rainfall that falls over the surface of the PWD.

The results of the 2022 water quality assessment carried out at the PWD are presented in Appendix F and Figures 32 and 33. The results are summarised as follows:

- Field pH was in the range 6.5 to 8.4, relatively steady throughout 2022.
- Field EC was in the range 1,360 to 3,000 uS/cm, short term rising trend from April to June 2022, then relatively steady.
- Field TTA ranged from 5 to 38 mg/L, generally below 20 mg/L in 2022.
- Field Total Alkalinity ranged from 30 to 147 mg/L, with no evident trend in 2022.
- TDS concentrations ranged between 600 and 1,700 mg/L.
- Total Acidity was below 8 mg/L and Total Alkalinity was generally below 140 mg/L.
- SO_4:Cl ratio was between 0.1 and 0.9.
- Iron concentrations were generally below 0.7 mg/L.
- Aluminium concentrations were low (<0.15 mg/L).
- Manganese concentrations were low (generally below 0.2 mg/L with spikes up to 0.96 mg/L).

Generally, the water discharged from the PWD over the review period was marginal to brackish, slightly acidic to slightly alkaline and of similar quality to the average Superficial aquifer groundwater chemistry (due to dewatering), with some water quality variations as a result of mixing of the Superficial groundwater (due to dewatering) with rainwater (due to heavy rainfall events). No exceedance of the PWD water quality default trigger levels (as per Table 11) occurred during 2022.

7.7. Off-Site Discharge Water Quality

Over the 2022 reporting period, water was discharged off-site using the Licenced Discharge Point W1 and the Emergency Discharge Point E2 on multiple occasions. The results of field and laboratory water quality are presented in Figures 34 and 35 and tabulated in Appendix G.

The2022 field and laboratory results are summarised as follows:

- Field pH was in the range 7 to 8.4 (neutral to slightly alkaline).
- Field EC was generally in the range 1,260 to 3,000 uS/cm; with occasional one-off spikes in values.
- TDS concentrations ranged between 730 and 1,700 mg/L.
- Field TTA was 8 to 38 mg/L.
- Total Acidity was below 5 mg/L and Total Alkalinity was below 120 mg/L.
- SO_4:Cl ratio was less than 0.8.
- Iron concentrations were below 0.36 mg/L.
- Aluminium concentrations were below 0.24 mg/L.
- Manganese concentrations were low (0.009 mg/L).

Generally, the water discharged from the licenced and emergency discharge points was of similar quality to the Superficial aquifer water chemistry (Section 7.4.1) and the surface water chemistry (Section 7.7). There are some water quality variations as a result of mixing of the rainwater with Superficial groundwater (in 2022 due to dewatering). No exceedance of the off-site water quality default trigger levels (as per Section 5.5.4) occurred during 2022.

No off-site water discharges via the emergency discharge points E1 were recorded during 2022, therefore water samples were not collected for field measurements and laboratory analysis.

7.8. Surface Water Quality

During the 2022 reporting period, all surface water monitoring sites (YALSW01 to YALSW14) were visited for water sampling on a monthly basis, as per the recent GWOS amendment (Table 9).

The monitoring results to date indicate that surface water flows around the site are limited to winter and spring seasons (i.e. June/July to October/November), as recorded in most of Doral's surface water monitoring sites. The only exceptions were two sites YALSW04 and YALSW07, as they have recorded water every month since July 2017, due to both dams being fed by groundwater seepage.

The 2022 field and laboratory surface water results are presented in Figures 36 and 37, tabulated in Appendix H and summarised below:

- Field pH was in the range of 6 (YALSW03) to 8.6 (YALSW07); slightly acidic to slightly alkaline, but generally neutral (i.e. pH between 6.5 and 7.5); all within the historical range of pH values.
- Field EC was generally between 700 and 3,000 µS/cm for all surface water sites, except for site YALSW07, where higher EC readings were recorded (between 3,200 and 5,700 µS/cm). These increased EC values could be related to this dam having limited seepage connection with the groundwater, possibly due to clayey layers surrounding the wall of this dam, causing an increase in EC concentrations owing to evaporation. Additionally, at this site EC concentrations are the lowest during the wet season where rainfall peaks and the highest during dry seasons where rainfall is low. All are within the historical ranges.
- Field TDS concentrations ranged between 370 and 1,600 mg/L for all surface water sites, indicating water being fresh, becoming slightly brackish. The only exception is site YALSW07 where TDS concentrations range from 1,600 to 2,600 mg/L, being brackish, likely due to this dam having limited seepage and high evaporation. All are within the historical ranges.
- TSS values were all below 27 mg/L for the majority of surface water sites, and within historical ranges.
- Sulphate concentrations were generally below 200 mg/L, except for some one-off spikes recorded.
- Total Acidity (as $CaCO3$) was below 17 mg/L in all monitoring sites, all concentrations are within the historical ranges.
- There have been seasonal increasing trends of EC, TDS and sulphate in all surface water sites (except for YALSW07). These rising trends generally commence in June/July (i.e. at the start of the surface water flow) to October/November (i.e. when the flows diminish) and are likely related to sulphate leaching out from free draining soils up-slope of the Lower Sabina catchment during high rainfall or irrigation periods.

8. COMPLIANCE WITH MONITORING REQUIREMENTS

This GMS has been prepared to fulfil the reporting conditions of the Superficial licence GWL206603(1) for the period 1 January to 31 December 2022.

Records indicate that the monitoring requirements associated with the Superficial GWL were mostly met and complied with during the 2022 review period. The only non-compliances during the review period were that totalising flow meters should be installed at each active pit to monitor the abstraction volumes. In 2022, part of abstraction volumes from active mine pits were estimated based on pump worked hours, due to the lack of available flow meters, particularly when dewatering was initially required at each active pit. It should be noted that all pumps have now flow meters installed to ensure compliance mowing forward.

9. ASSESSMENT OF IMPACTS

9.1. Aquifer Water Levels

During the 2022 reporting period, the groundwater levels in the Superficial and Leederville aquifers at the Yalyalup mine have generally not been affected by any mining activities (i.e. pit dewatering and backfilling and off-site discharge), apart from some localised exceptions. Dewatering commenced in January 2022 and has continued to the end of reporting period (December 2022). Most of groundwater elevations recorded in the Superficial and Leederville monitoring bores during 2022 were within the historical range of values and within the range of natural seasonal water level variations associated with the winter-dominated rainfall recharge to the aquifers and generally showed no evidence of any long-term trends. The only exceptions to the above were five Superficial aquifer bores YA_MB05S, YA_MB11S, YA_MB12S, YA_MB35_GDE and YA_MB37_GDE, which showed short-term (a few months) reduction in water elevations (i.e. drawdowns up to between 0.5 and 3 m), owing to mining and dewatering at the nearby active mine blocks. Additionally, Leederville aquifer bores YA_MB31_L, YA_MB30_W and YA_MB23_L showed abstraction in 2022, consistent with previous years.

Overall, the impact on groundwater levels in the Superficial and Leederville aquifers due to the Yalyalup mine operation, over the 2022 reporting period, has been very limited. Any changes that have occurred (in the Superficial aquifer) are very localised (adjacent to the active pits) and temporary in duration. The recovery of water levels commences immediately mining of each active mine pit is completed, owing to the backfilling of mined-out pits with sand and clay tails.

9.2. Aquifer Chemistry

Water quality data collected during the 2022 review period from the Superficial and Leederville aquifers monitoring bores at the Yalyalup site show the groundwater to be generally fresh to marginal, acidic to neutral, with low total acidity, total alkalinity, SO_4:Cl ratios and concentrations of sulphate, aluminium and manganese. There were some elevated iron concentrations (up to 30 mg/L) in monitoring bores, but all were consistent with historical ranges. There were some temporary higher or lower concentration readings, but most of the water quality parameter values remained within a relatively small range of fluctuation consistent with historical data. In the majority of bores, no evidence of any unacceptable decreasing or increasing trends of changing water quality for the Superficial and Leederville aquifers was noted, including any salinity increase or significant change in chemical composition of water. The only exception to this occurred in the Superficial bores YA_MB05S and YA_MB06S. At YA_MB05S there were some water quality parameter increases (pH, salinity, total alkalinity, chloride, sulphate) since July 2022 due to the mining activities adjacent to this bore (e.g. seepage from the sand tails during nearby pit void backfilling). At bore YA_MB06S there were some water quality parameter decreases (pH, TDS, sulphate, chloride) from July 2022 onwards also due to nearby pit voids being backfilled with tails, where water from tails that had lower water quality parameters than YA_MB06S seeped through.

Overall, the impact on groundwater quality in the Superficial and Leederville aquifers, due to the post mining operation over the 2022 reporting period, has been very limited. Any changes that have occurred are very localised and short-lasting.

Surface water quality measured at selected surface water monitoring sites showed that existing off-site water discharge activities at the Yalyalup mine did not result in unreasonable changes in surface water quality at these locations, with only temporary spikes.

9.3. Effects on Other Users

Data collected during the 2022 reporting period indicate that the mining activities (i.e. active pit mining, pit dewatering, pit void backfilling) at the Yalyalup site result in only localised changes to water levels and water quality, with no increases on the regional scale. No impacts on other licensed Superficial aquifer users have been identified due to mining at Yalyalup. Three Leederville aquifer bores YA_MB31_L, YA_MB30_W and YA_MB23_L reported small drawdowns as a response to abstraction from these bores (not related to Yalyalup mining).

9.4. Effects on GDEs

No groundwater drawdown in the Superficial aquifer has been reported to extend beyond the Yalyalup mining area during 2022. Therefore, there should be no impact to any of three high value wetland GDEs, located approximately 6 km to either the northeast and southwest of the site.

The magnitude of drawdowns along the McGibbon Track, where sensitive vegetation has been identified, will vary depending upon the proximity of the active mining pits. During 2022, short term (2 months) drawdowns of up to 2.6 m, where recorded at YA_MB35_GDE, owing to mining and dewatering of pit 91. These drawdowns are localised in the immediately area of the active mining (i.e. there were no drawdowns recorded in the nearby upstream bore (YA_MB08S) or downstream bore (SCPD28A). As per the current GWOS requirements, more frequent water level monitoring was undertaken during 2022, with the supplementation scheme being initiated in February and March 2022 (i.e. a total of 72,000 L was irrigated along the McGibbon Track using water carting). Vegetation monitoring increased to fortnightly once water level triggers were hit, with all existing sensitive vegetation still present along the McGibbon Track despite the limited surface supplementation. It should be noted that supplementation infrastructure is currently in place with the 2nd Yarragadee aquifer production bore YA_PB02 capable of supplying required volumes of clean water.

10. RECOMMENDATIONS

Given the low risk of adverse environmental impacts resulting from the groundwater pumping from the Superficial aquifer at the Yalyalup mine site, the monitoring programme currently being implemented for the site is considered appropriate.

Doral is committed to ongoing improvement to the water management system (including monitoring) with a view to being fully compliant with the current GWOS. It is recommended that the monitoring continue in accordance with the current GWOS and that the GWOS is continually reviewed to ensure the monitoring remains practical and representative, and that sufficient monitoring is in place.

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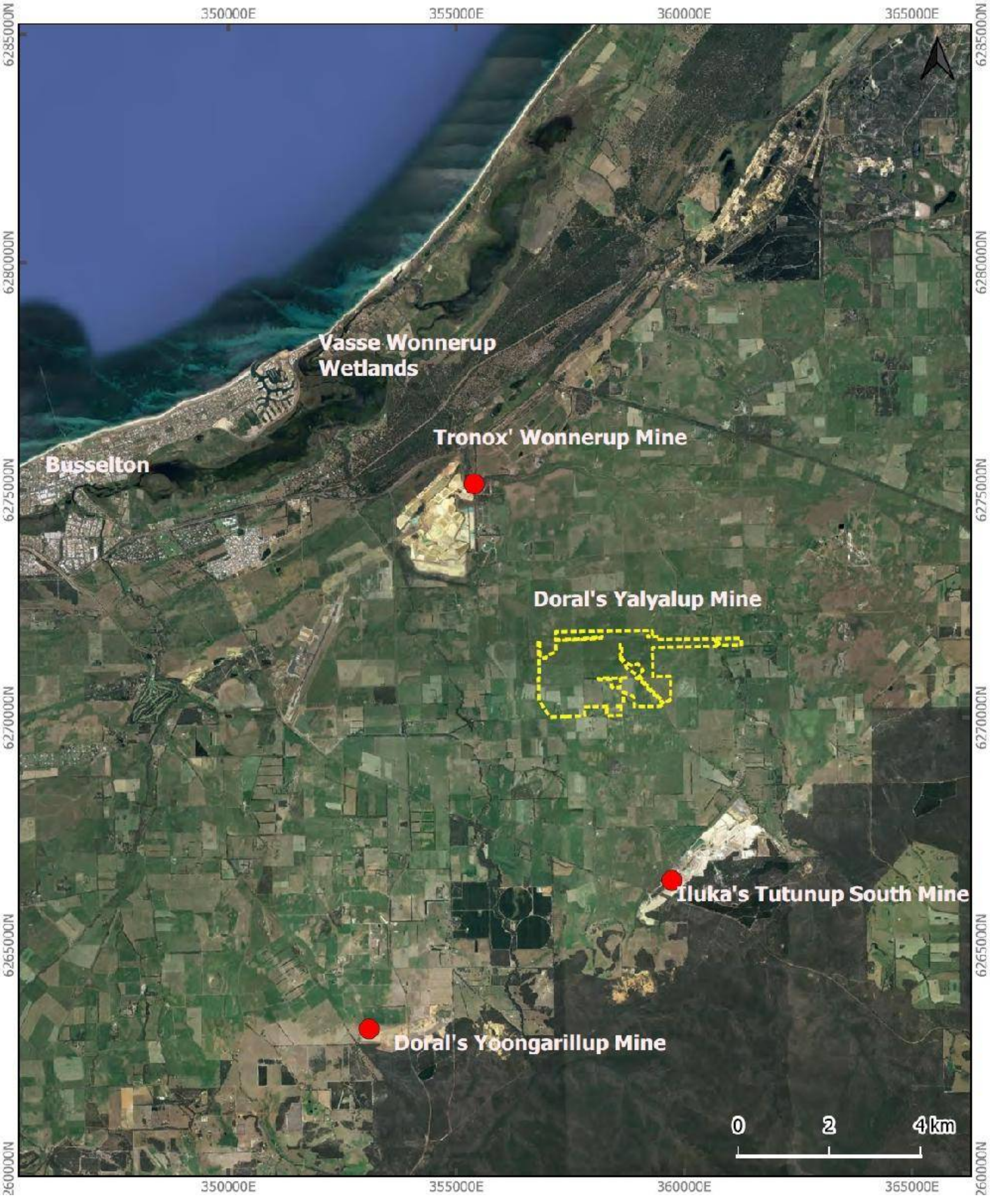
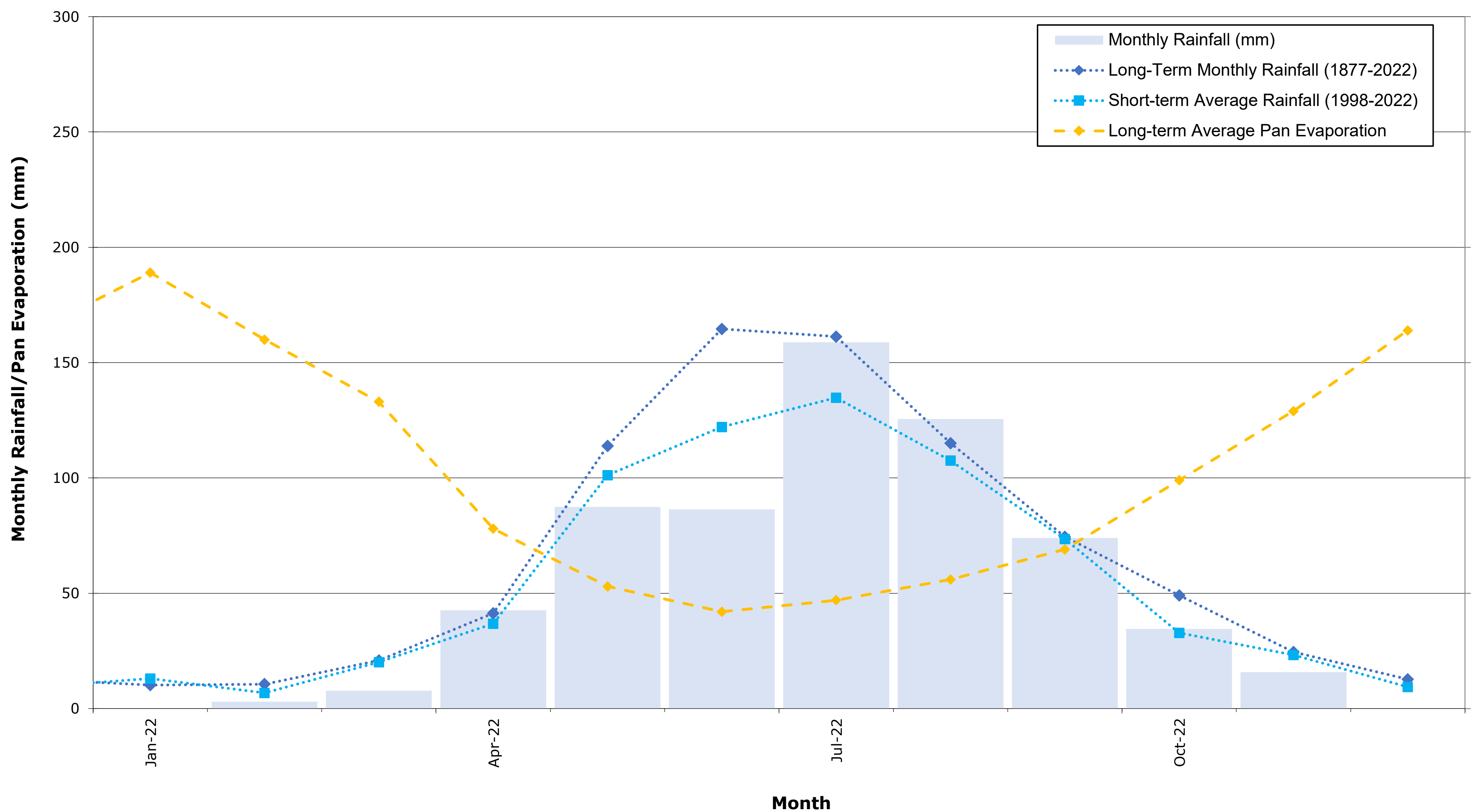
FIGURES

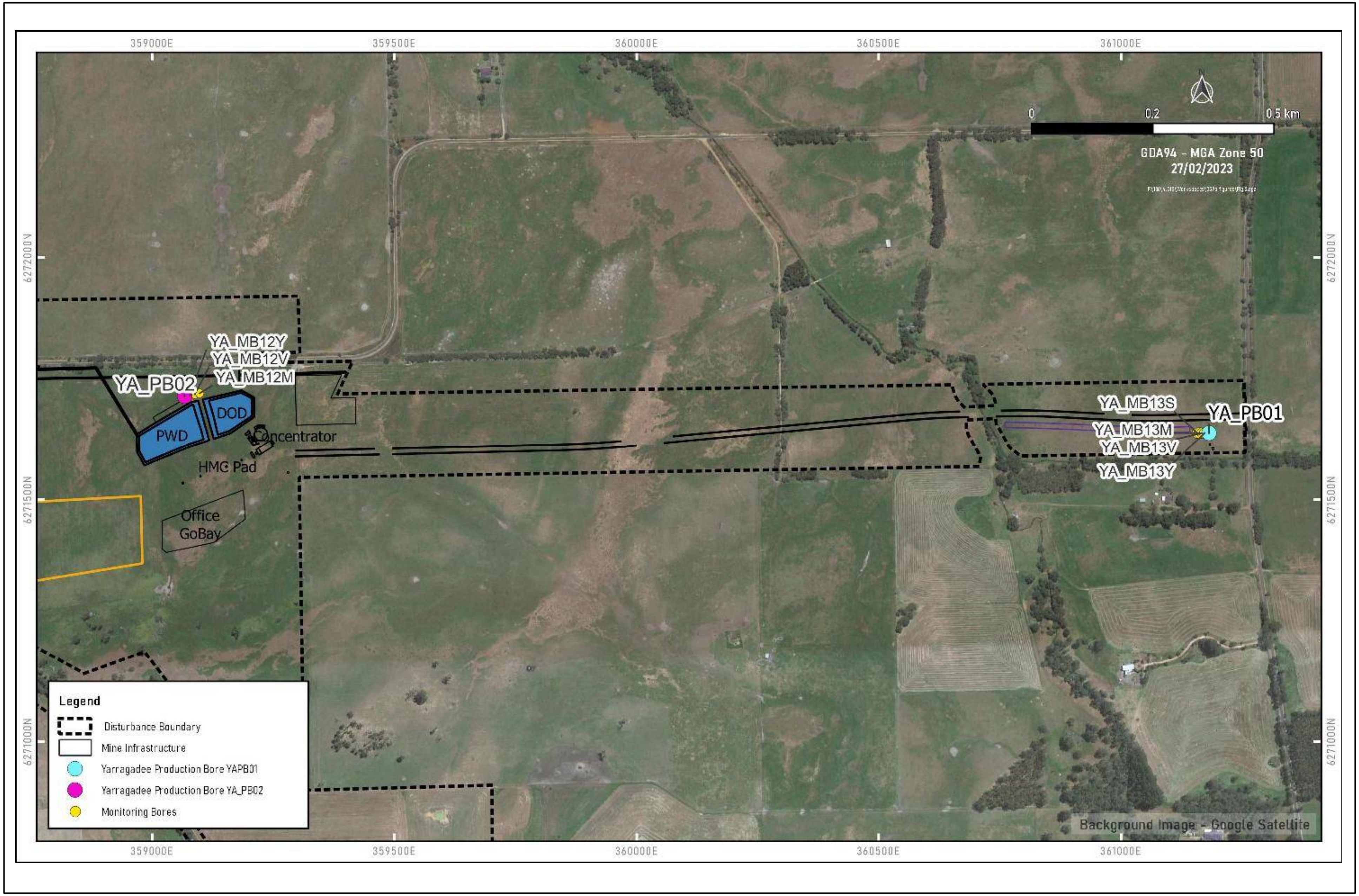


AQ2

Regional Location **FIGURE 1**

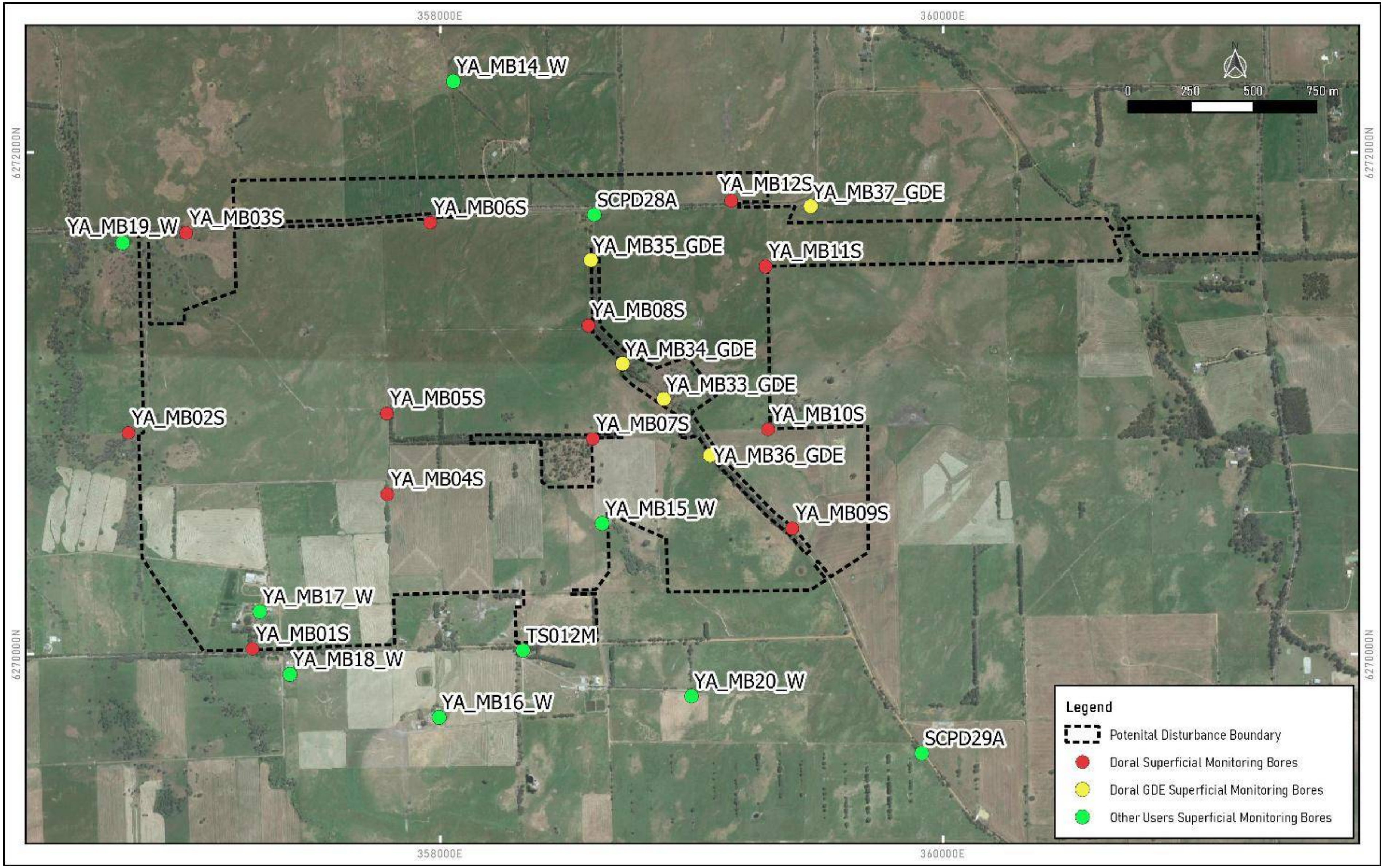


BUSSELTON RAINFALL AND PAN EVAPORATION DATA - Figure 2



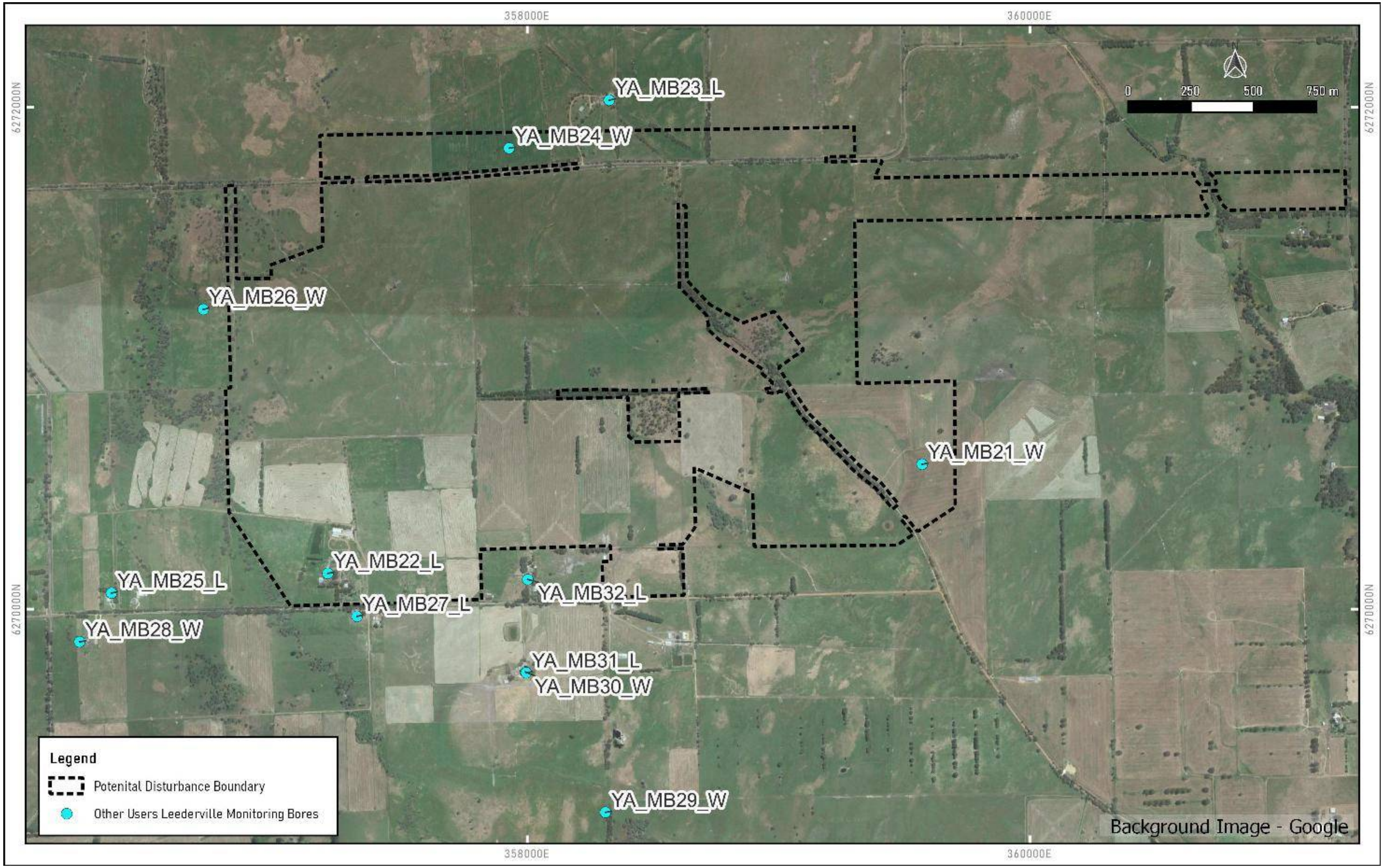
AQ2

Locations of Yarragadee Aquifer Production Bores YA_PB01 & YA_PB02 and Nest of Monitoring Bores at Yalyalup **FIGURE 3**



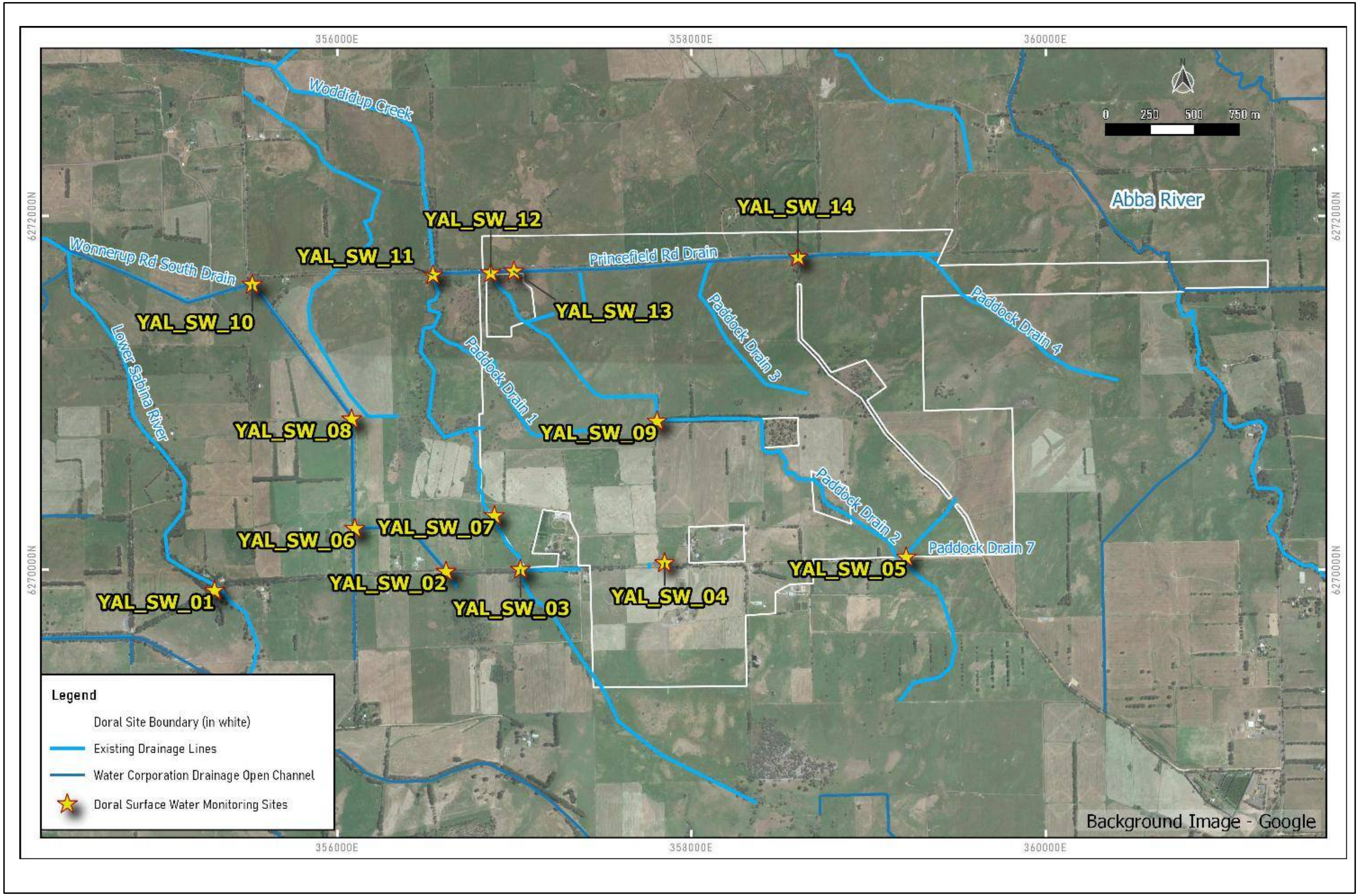
AQ2

Locations of Locations of Superficial Aquifer Groundwater Monitoring Bores and at Yalyalup **FIGURE 4**



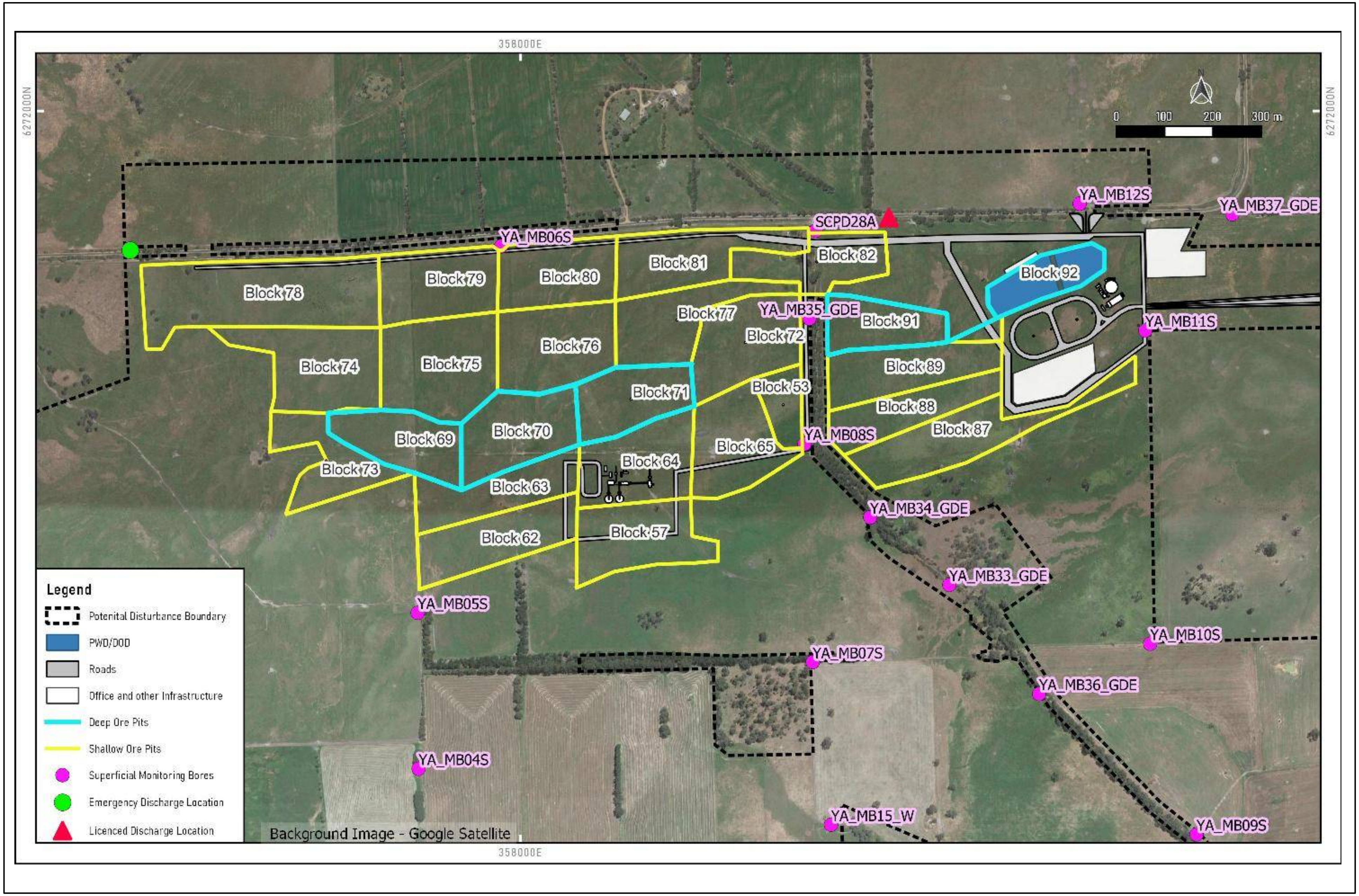
AQ2

Locations of Locations of Leederville Aquifer Groundwater Monitoring Bores at Yalyalup **FIGURE 5**



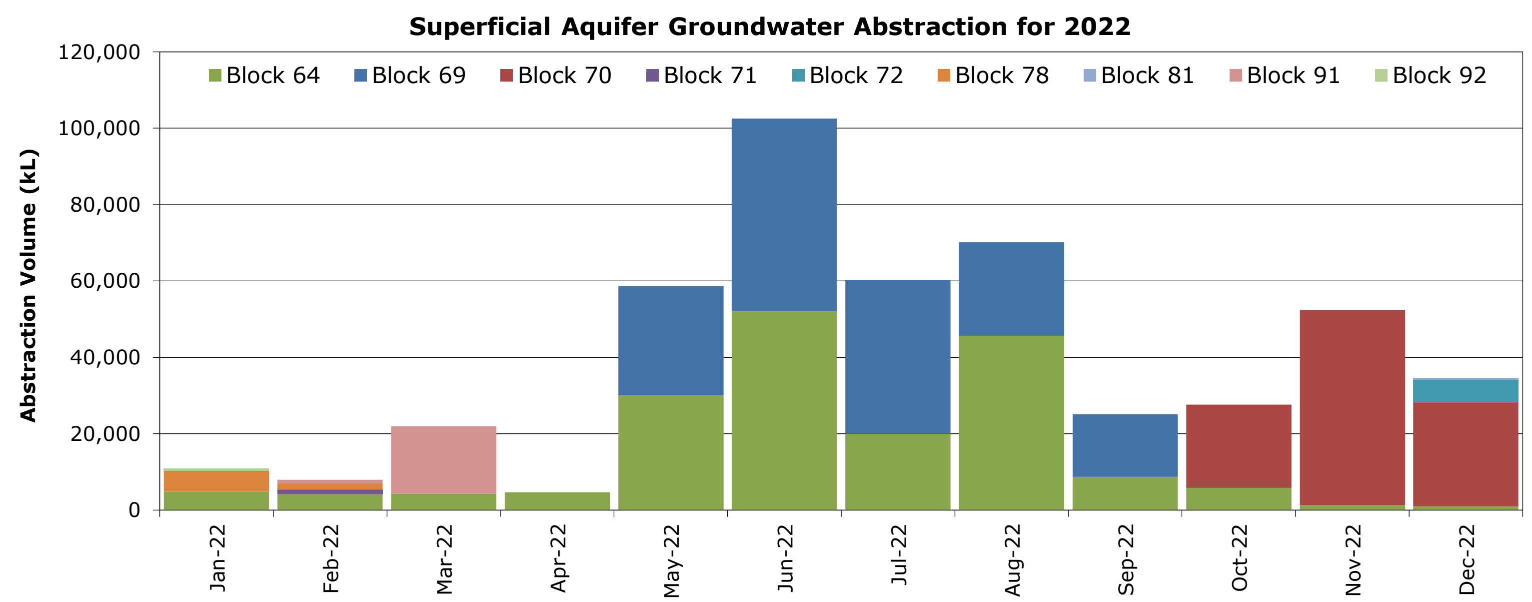
AQ2

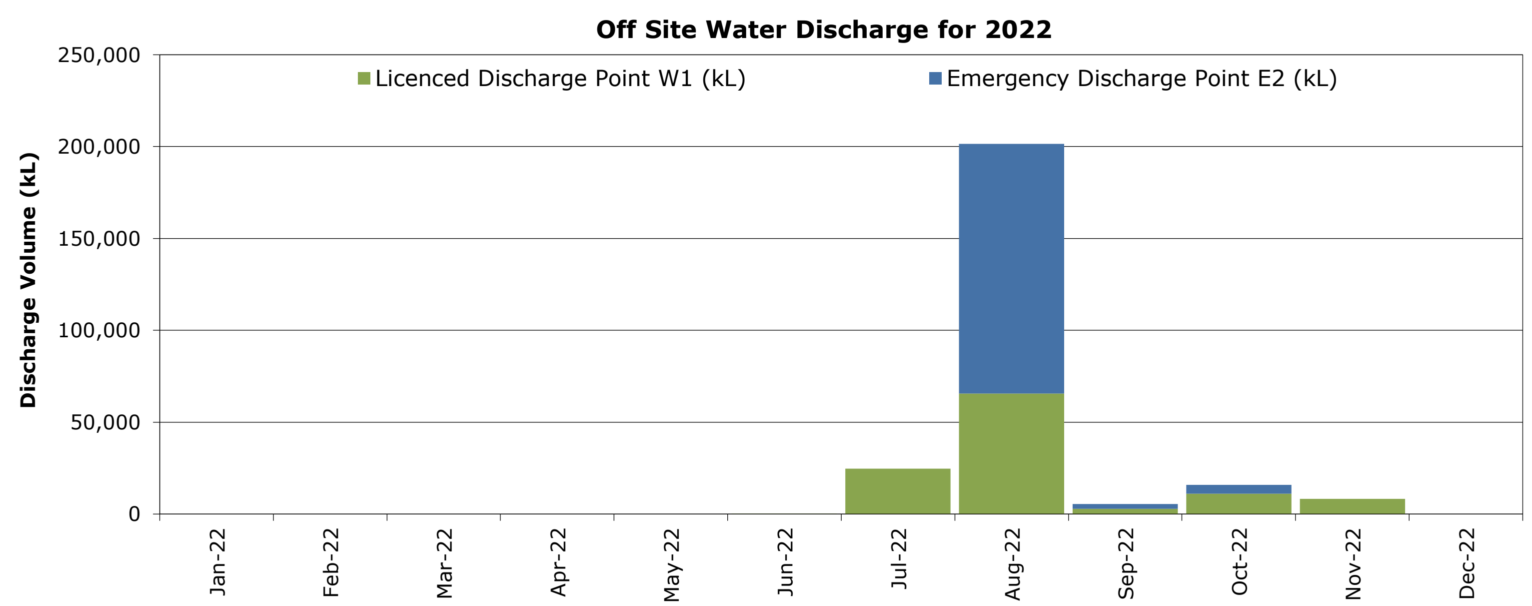
Local Surface Water Drainage, Surface Water Monitoring Sites FIGURE 6

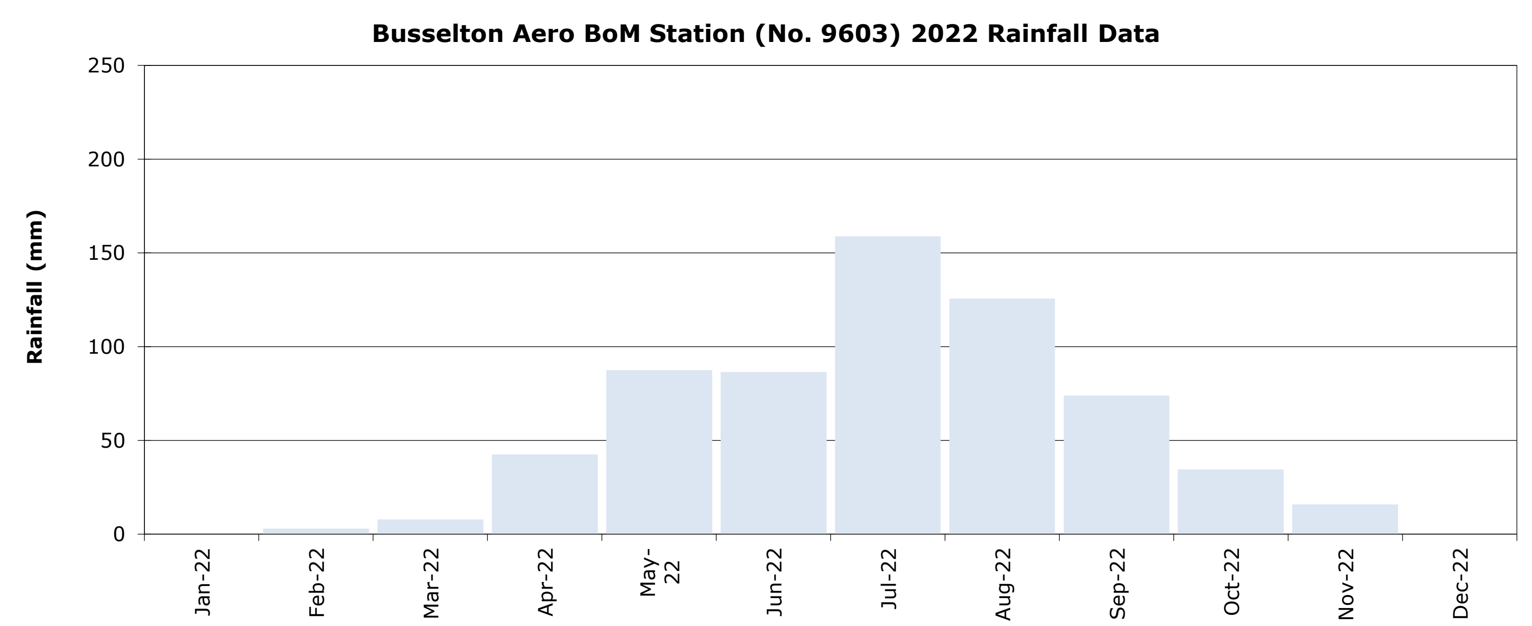


AQ2

Yalyalup Ore Mined During 2022 FIGURE 7







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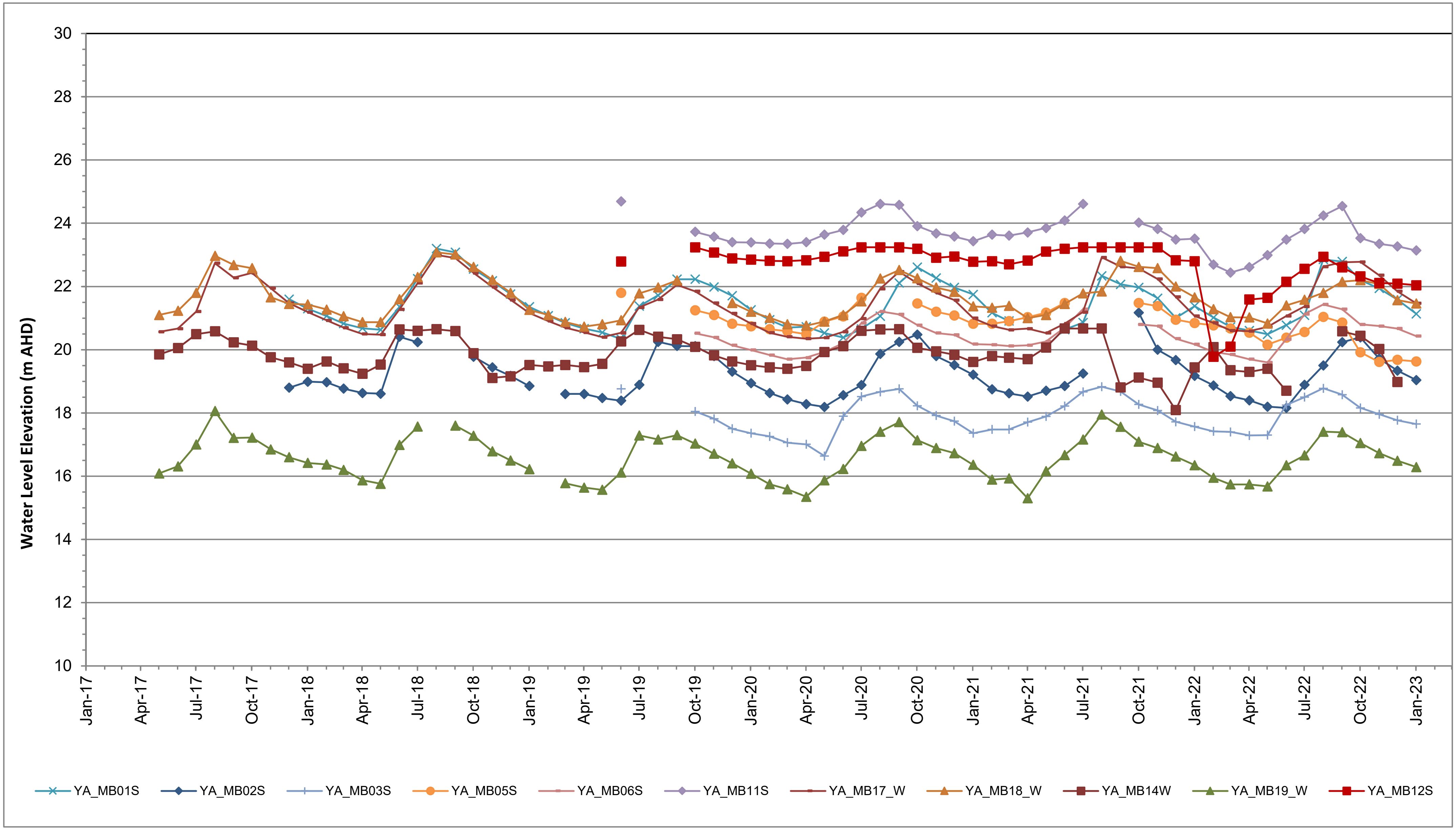
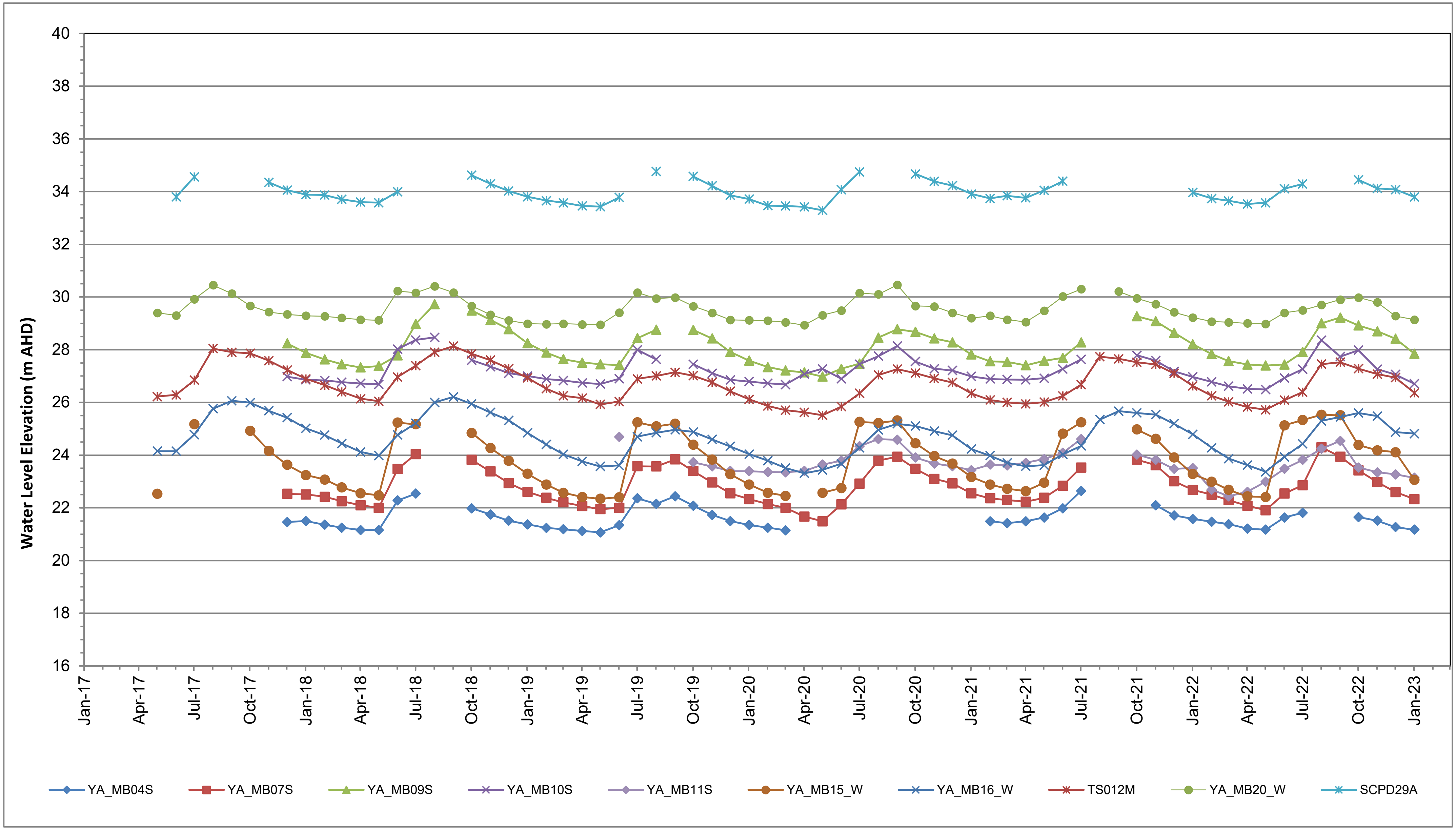
GROUNDWATER ABSTRACTION AND OFF SITE WATER DISCHARGE VOLUME DATA , JANUARY TO DECEMBER 2022 FIGURE 8



AQ2

Monitoring Bore Water Level Elevations m AHD (Superficial Aquifer) FIGURE 9a



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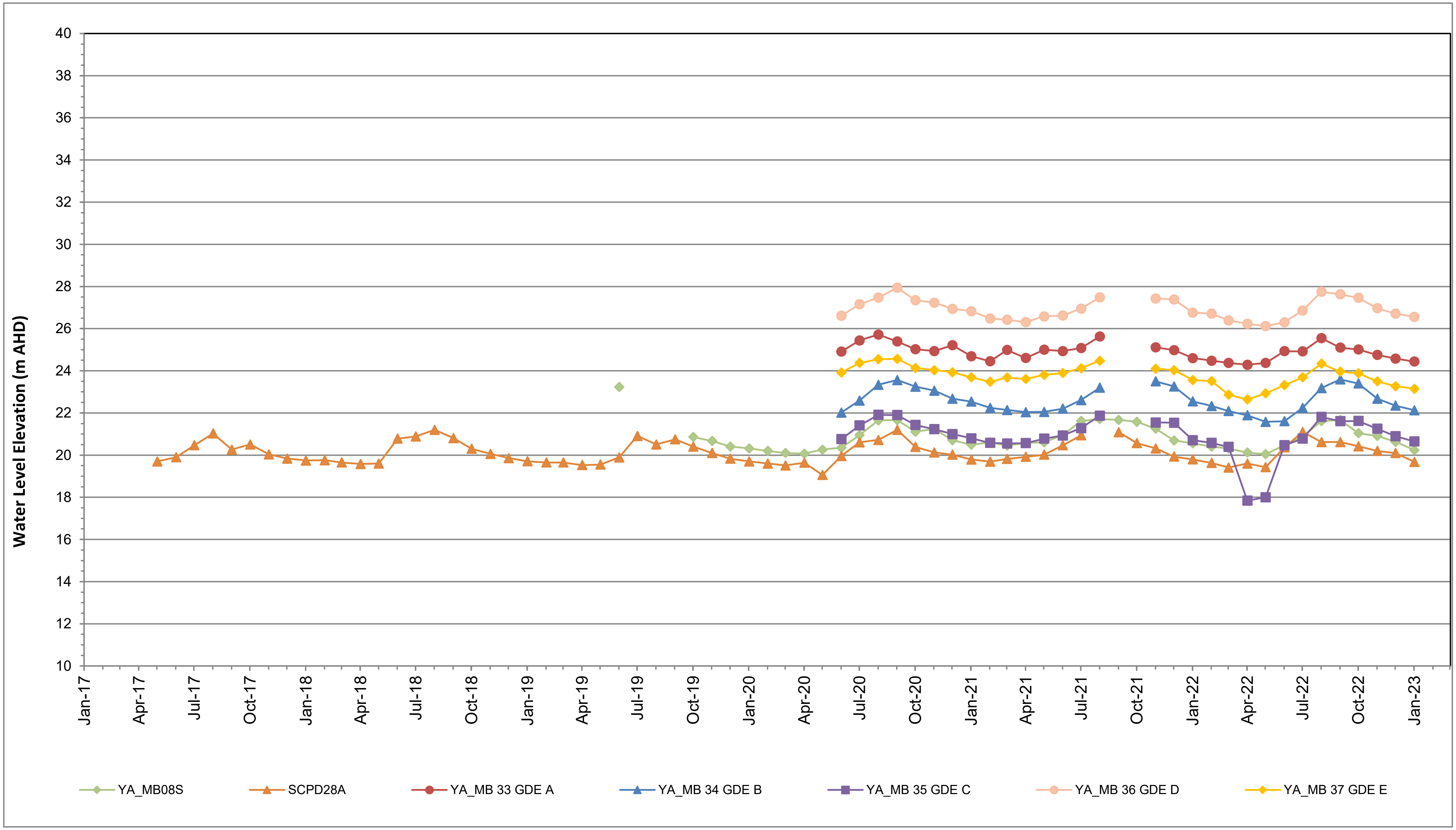
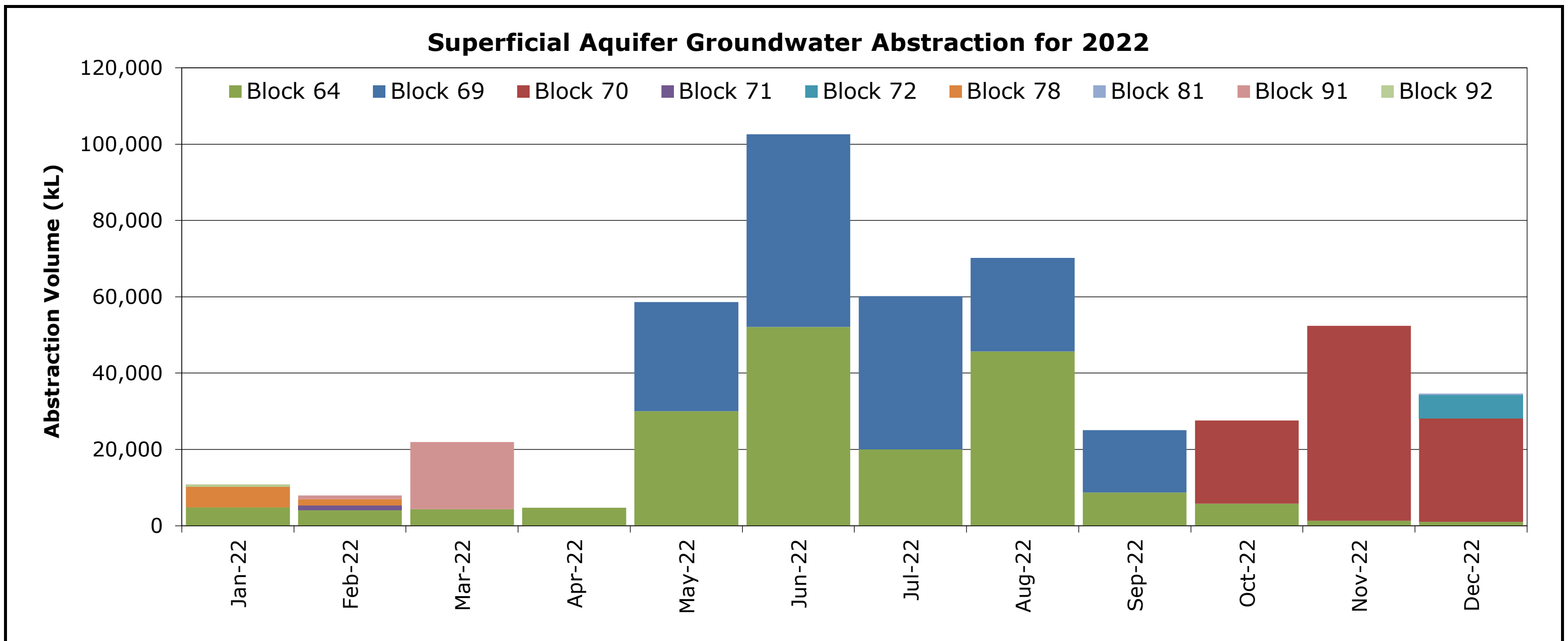
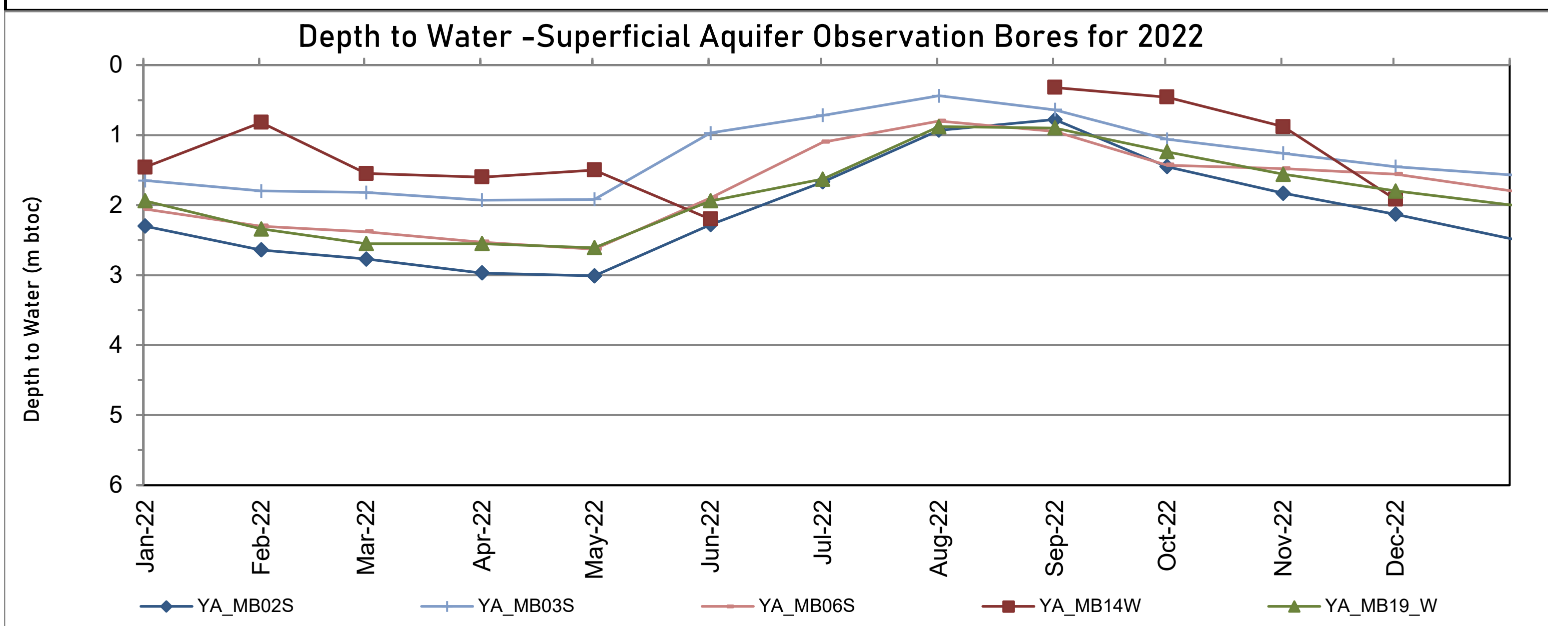
Monitoring Bore Water Level Elevations m AHD (Superficial Aquifer) FIGURE 9b

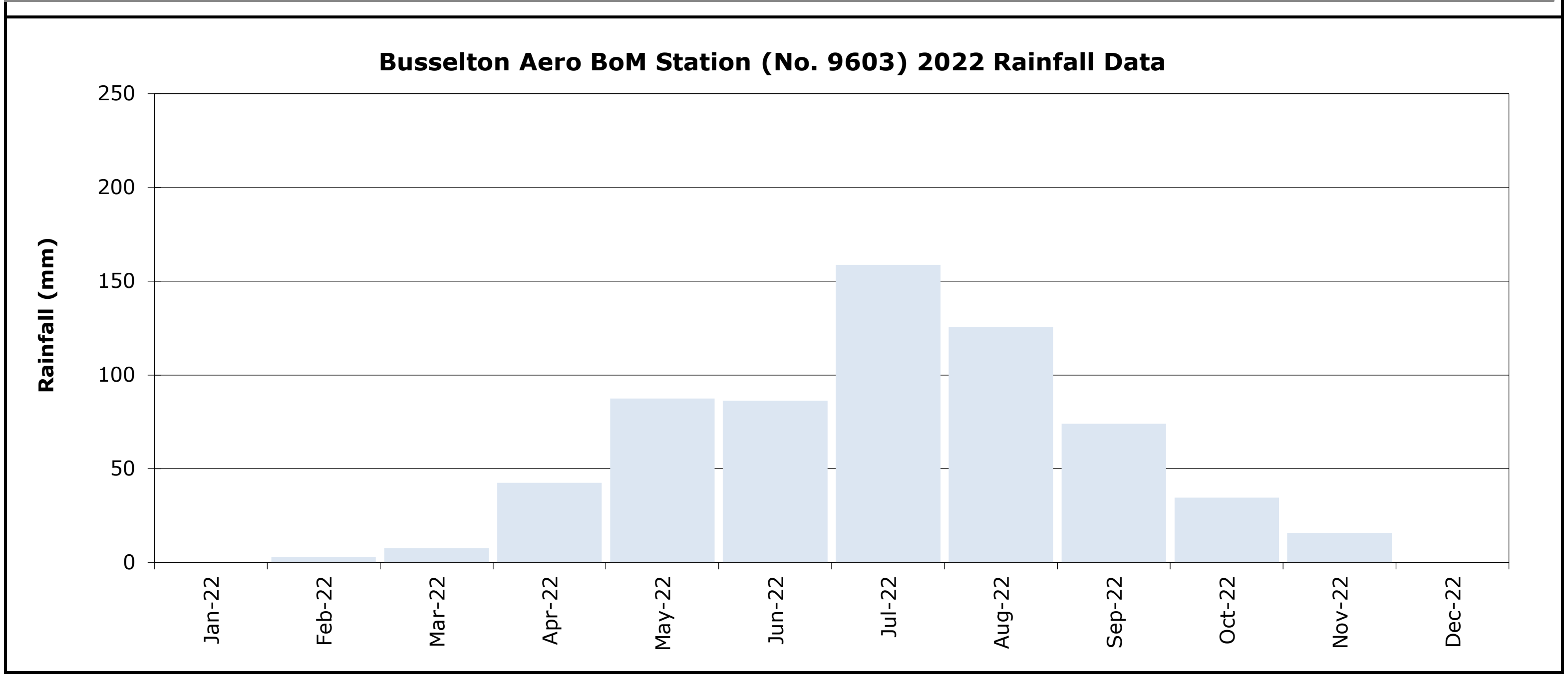


AQ2

Monitoring Bore Water Level Elevations m AHD (Superficial Aquifer) FIGURE 9c

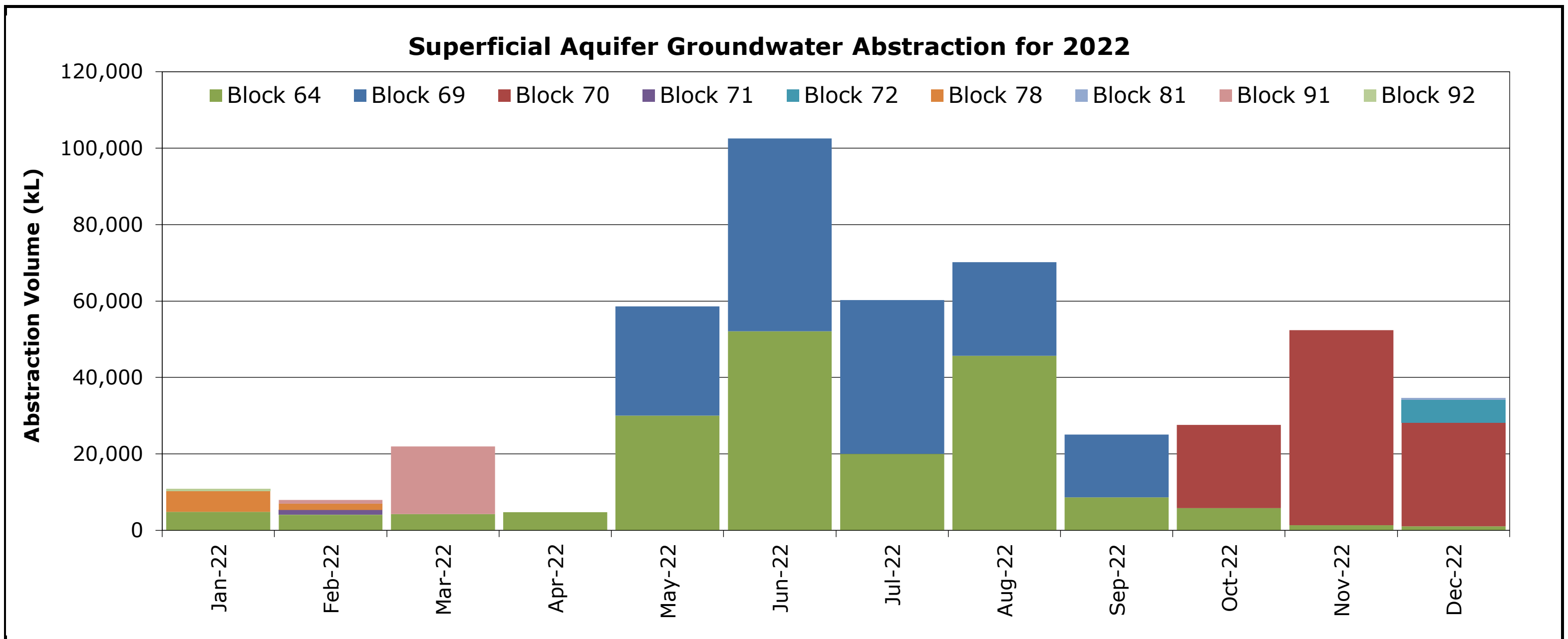


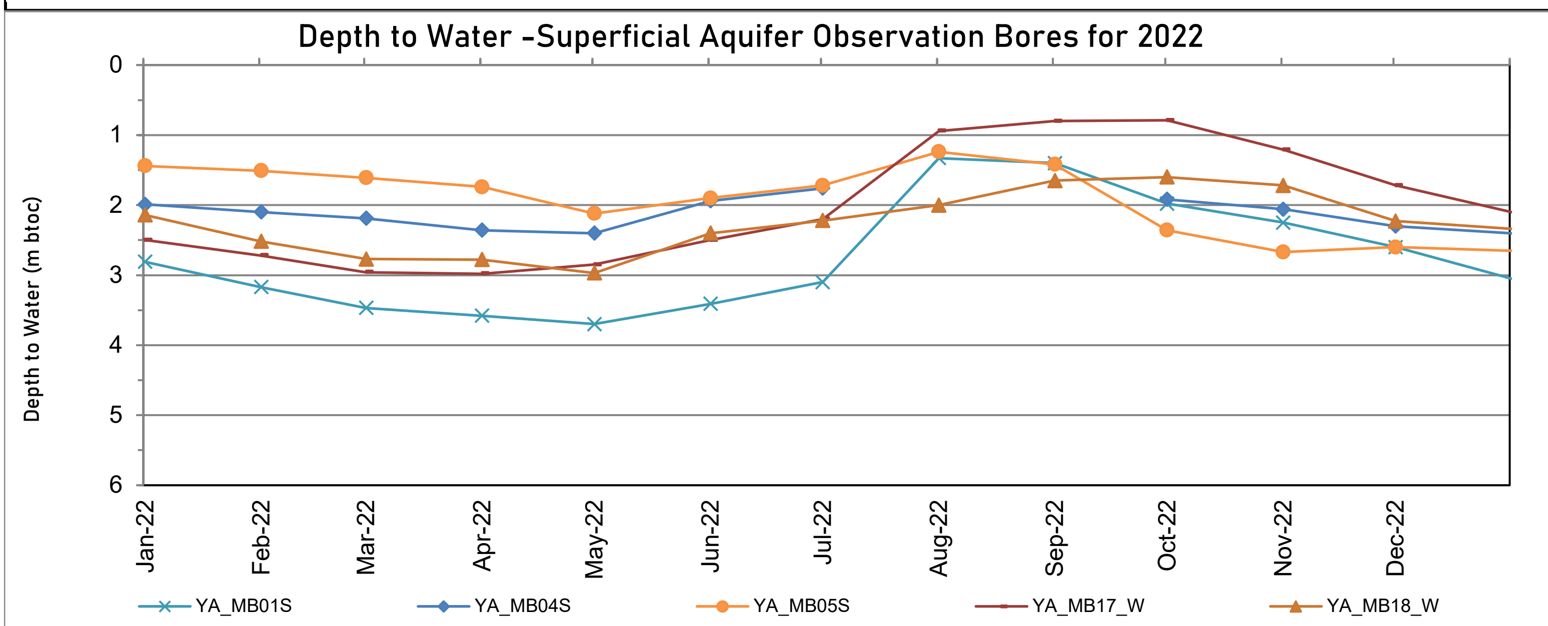


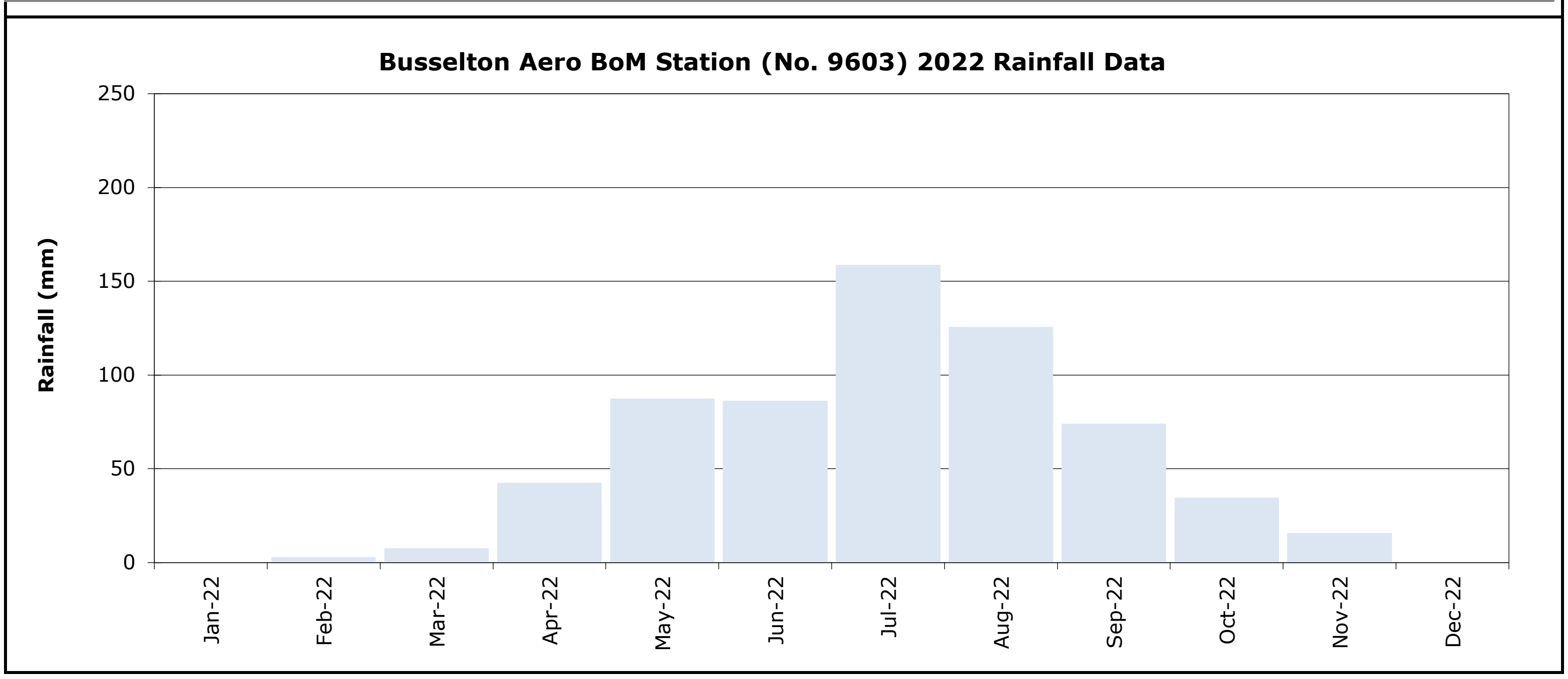


AQ2

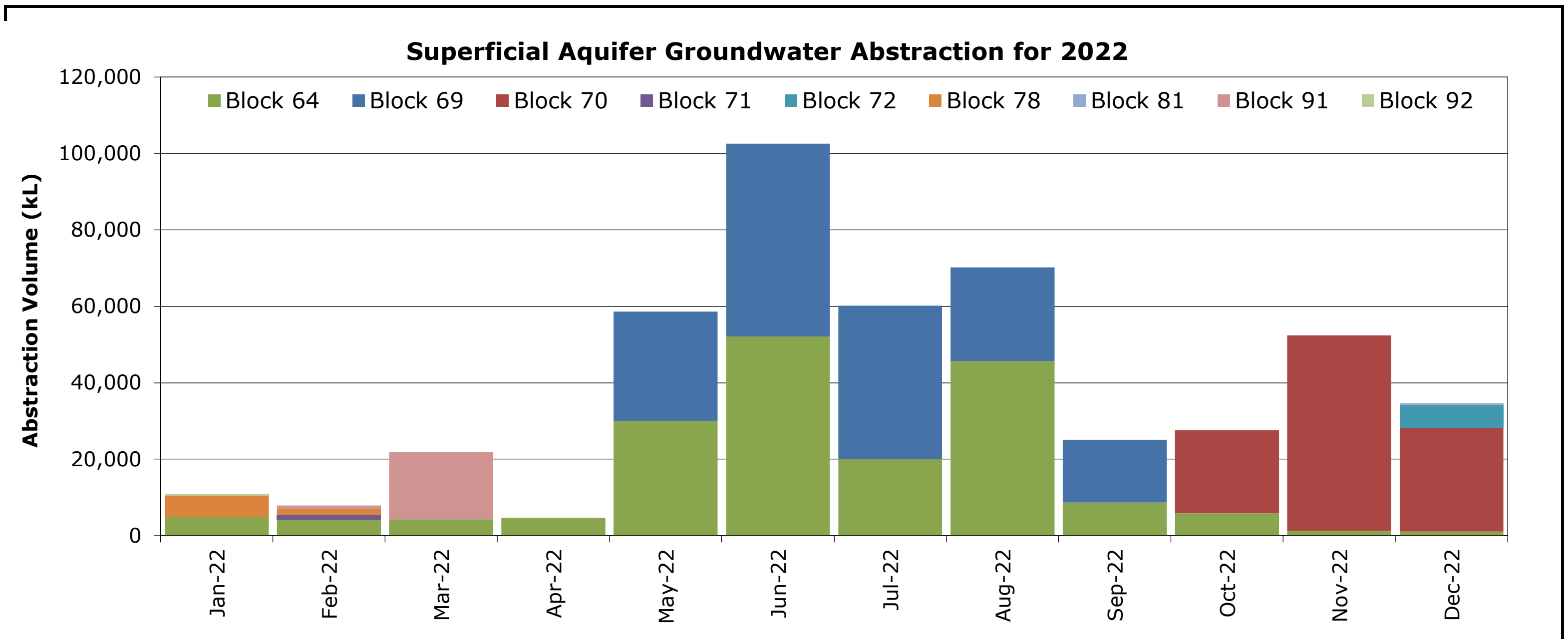
BOREFIELD DEWATERING AND WATER LEVEL DATA YAMB02S, YAMB03S, YAMB06S, YAMB14W AND YAMB19W, JANUARY TO DECEMBER 2022 FIGURE 10a

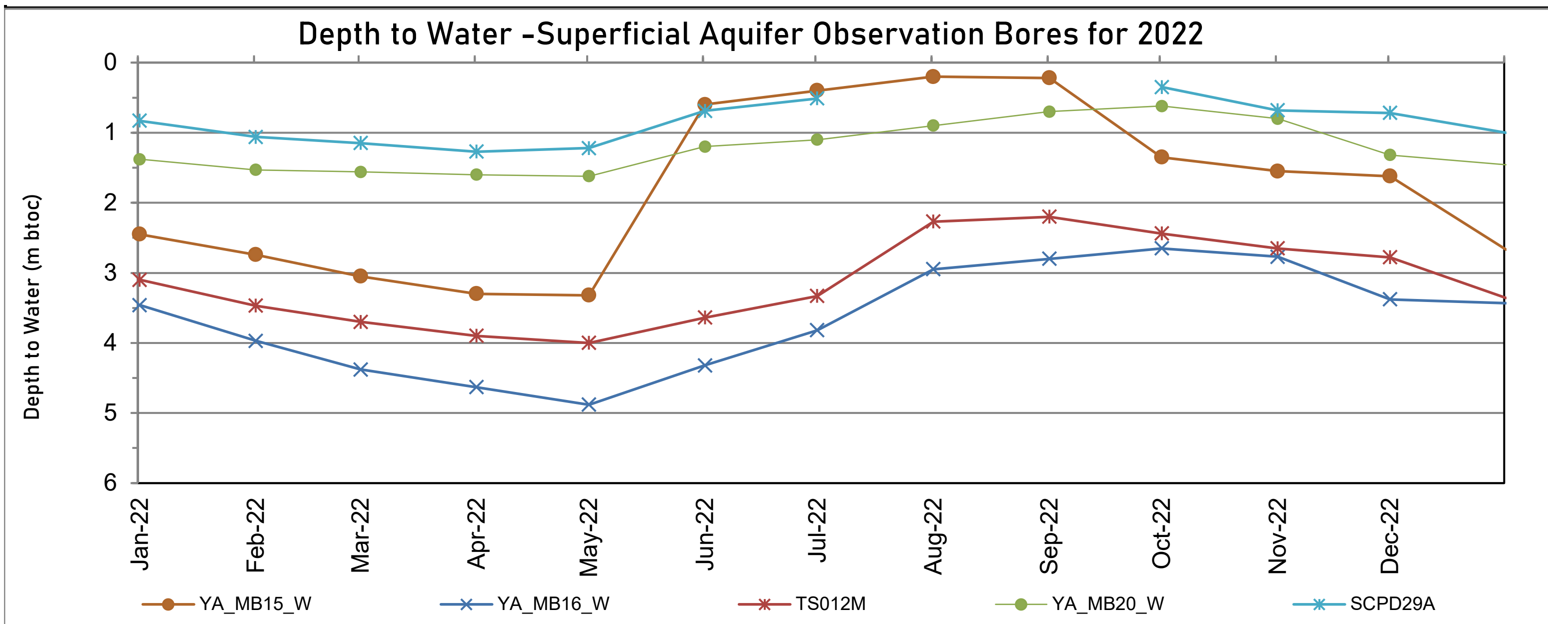


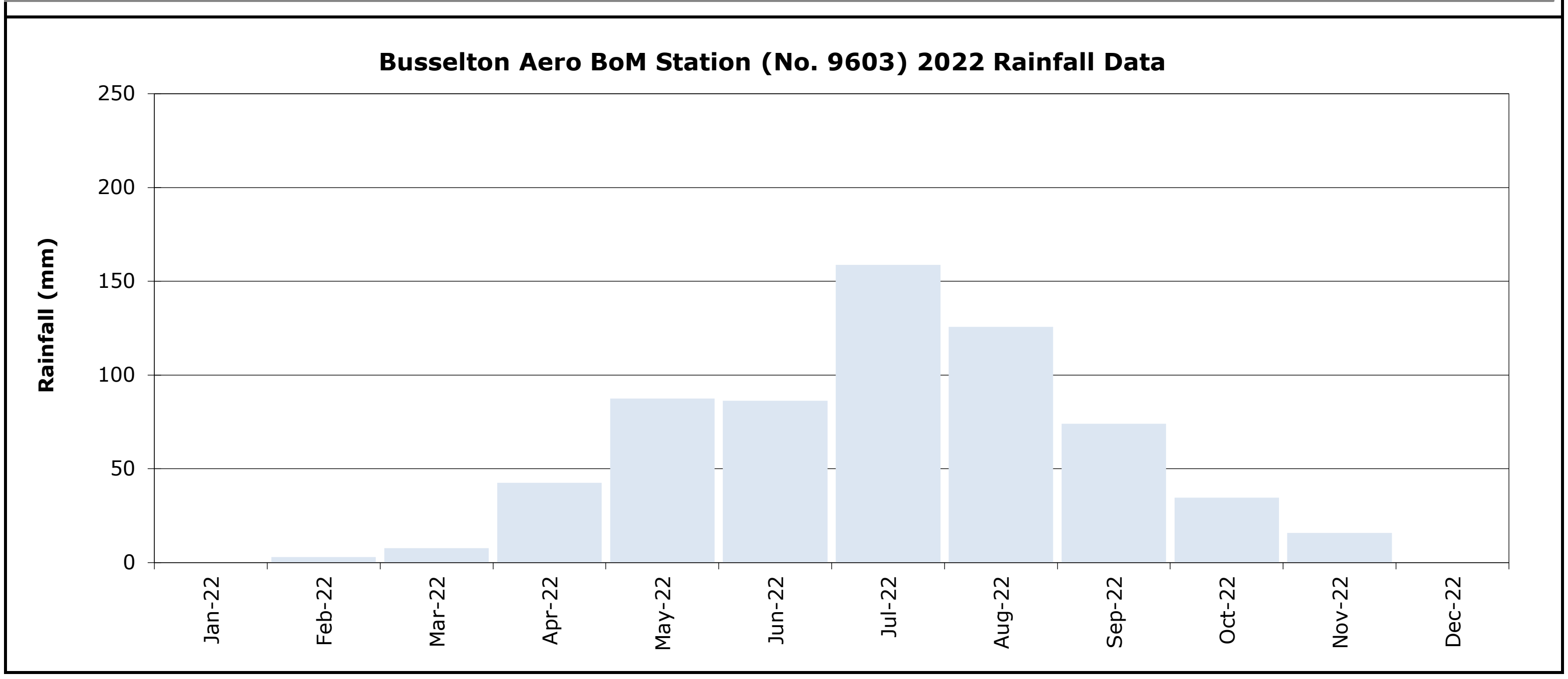




BOREFIELD DEWATERING AND WATER LEVEL DATA YAMB01S, YAMB04S, YAMB05S, YAMB17W AND YAMB18W, JANUARY TO DECEMBER 2022 FIGURE 10b







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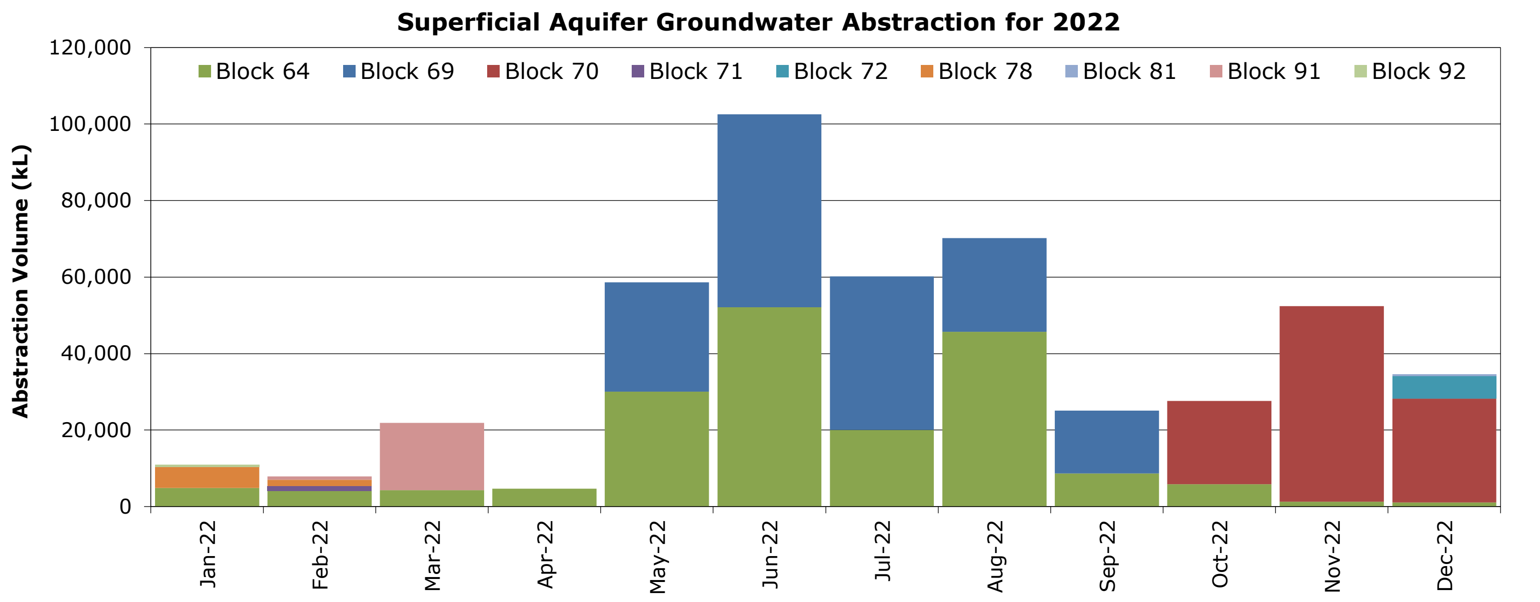
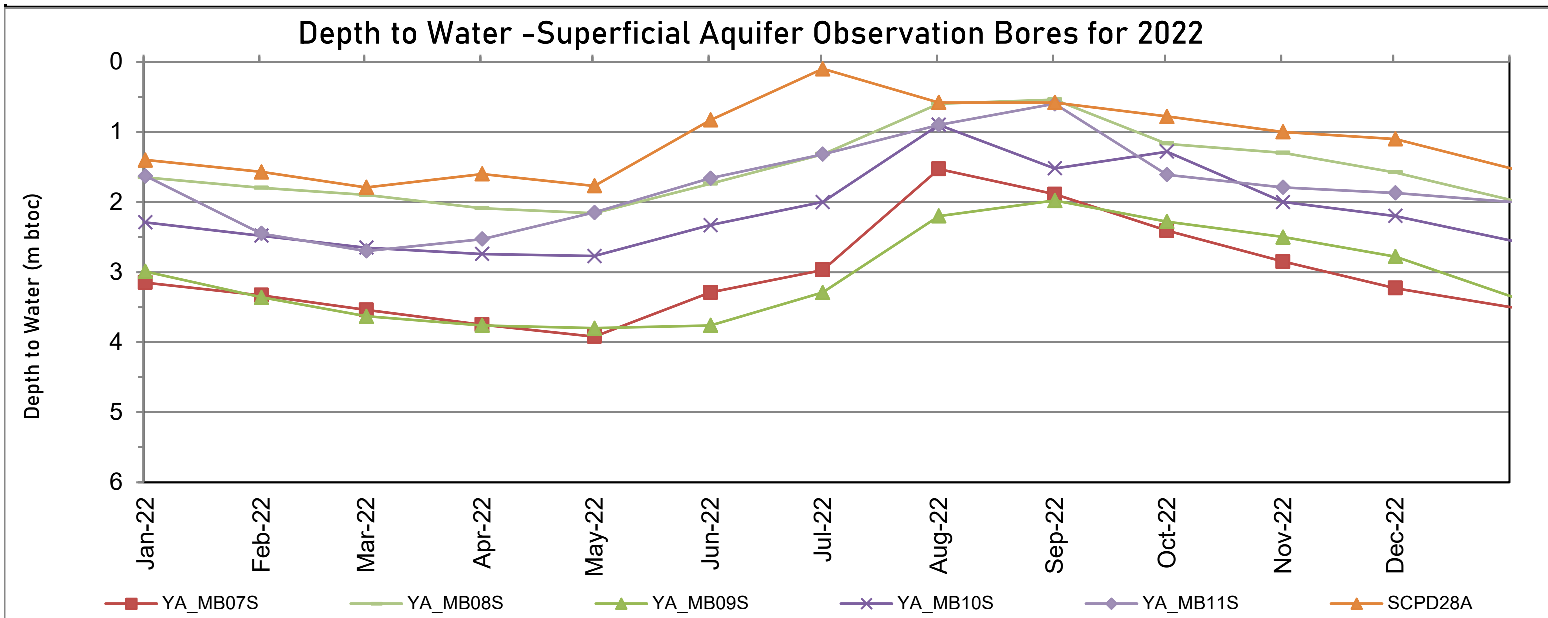
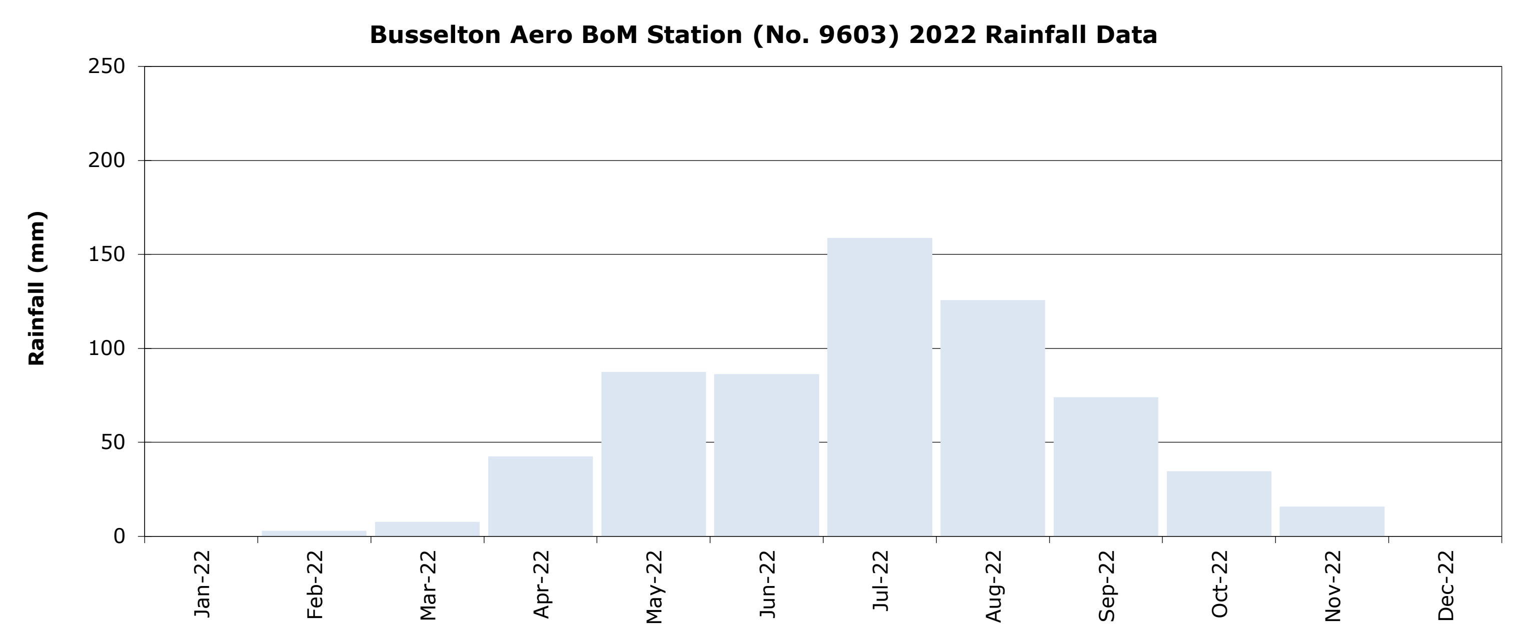
BOREFIELD DEWATERING AND WATER LEVEL DATA YAMB15W,YAMB16W, TS012M, YAMB20W AND SCPD29A, JANUARY TO DECEMBER 2022 FIGURE 10c

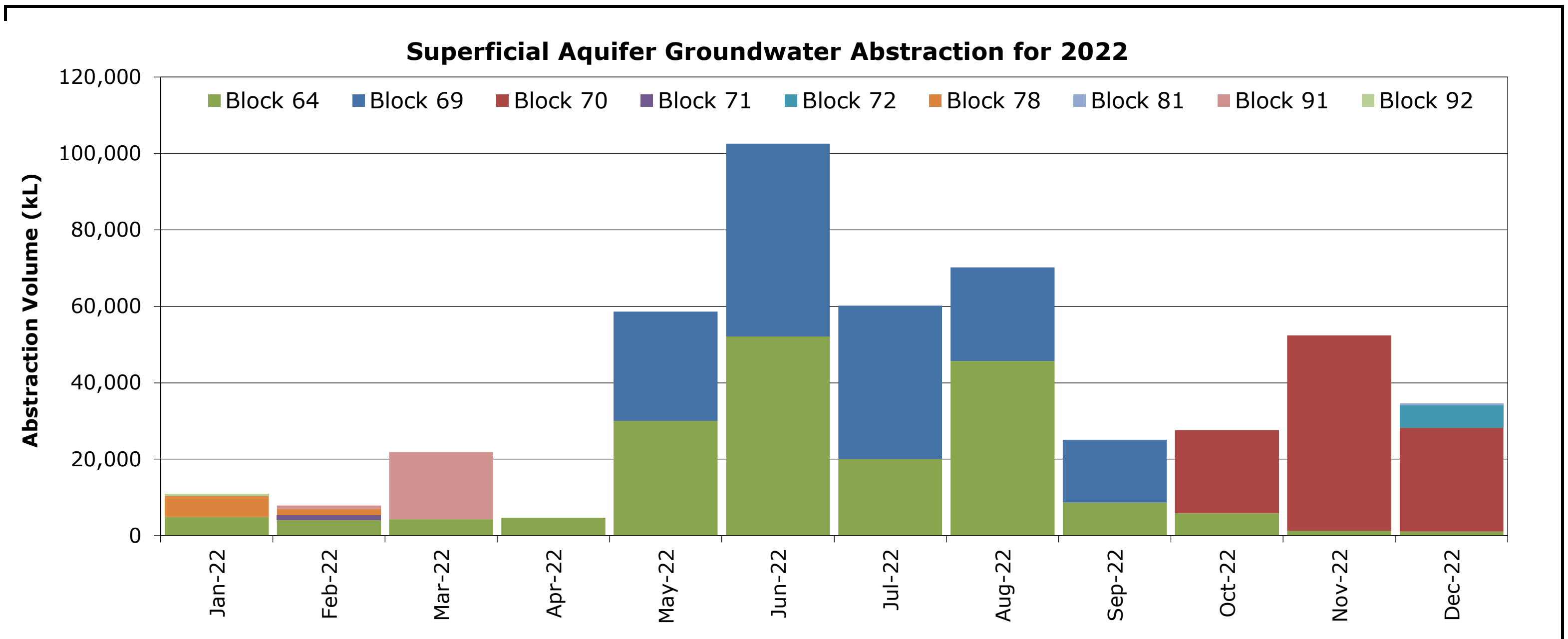


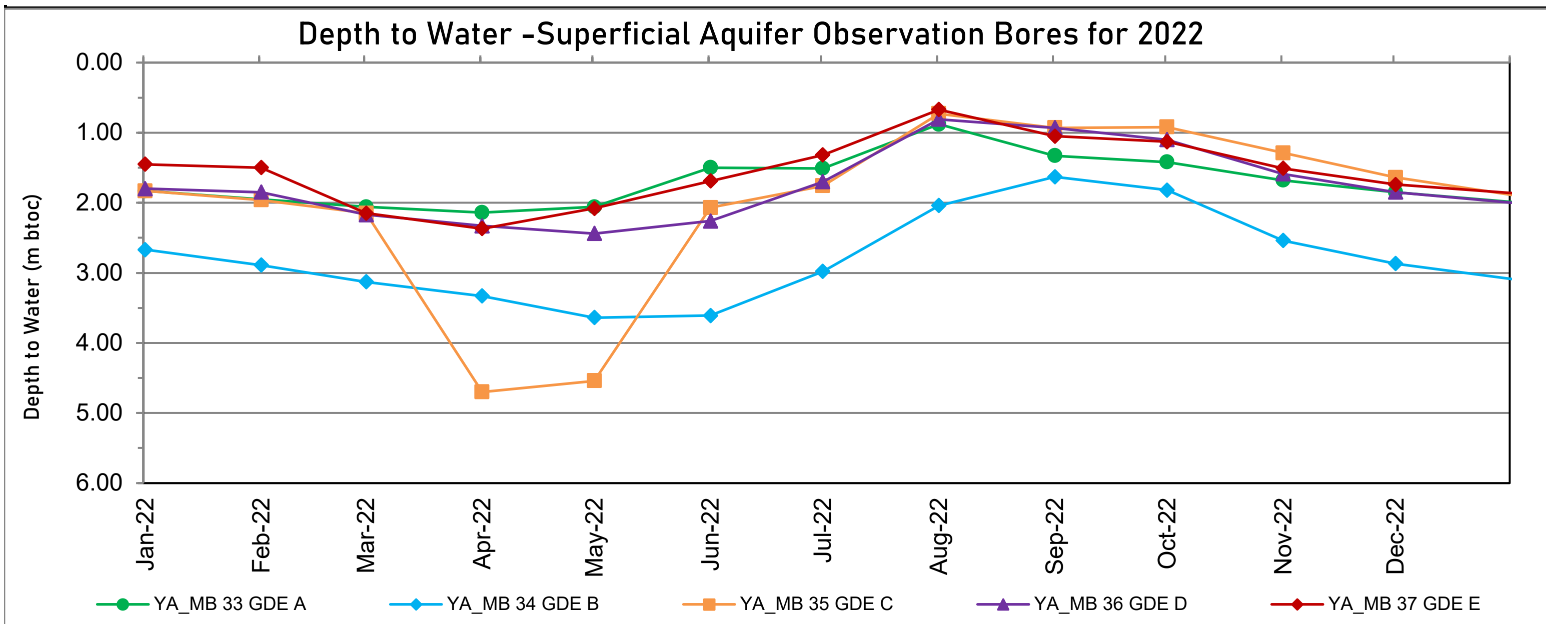


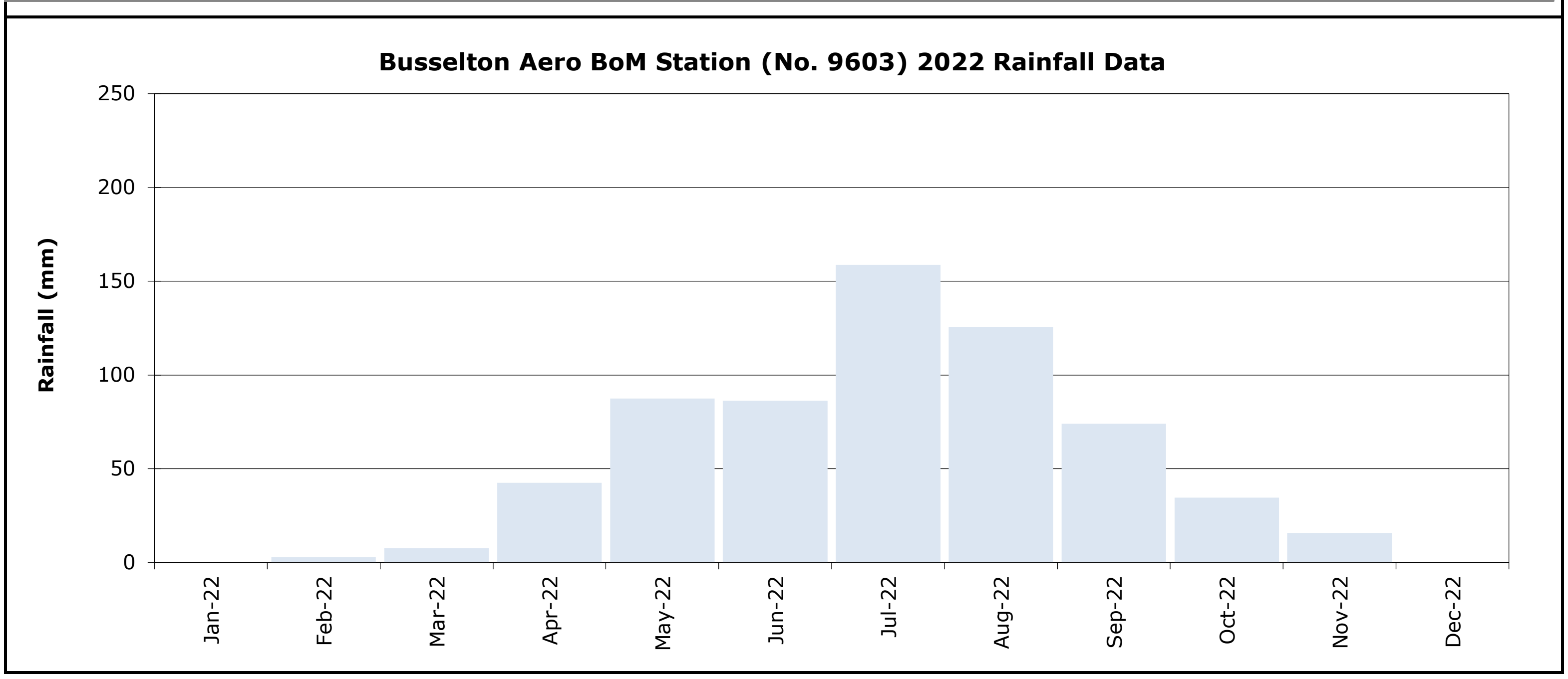


AQ2

BOREFIELD DEWATERING AND WATER LEVEL DATA YAMB07S, YAMB08S, YAMB09S YAMB10S YAMB11S AND SCPD28A, JANUARY TO DECEMBER 2022 FIGURE 10d

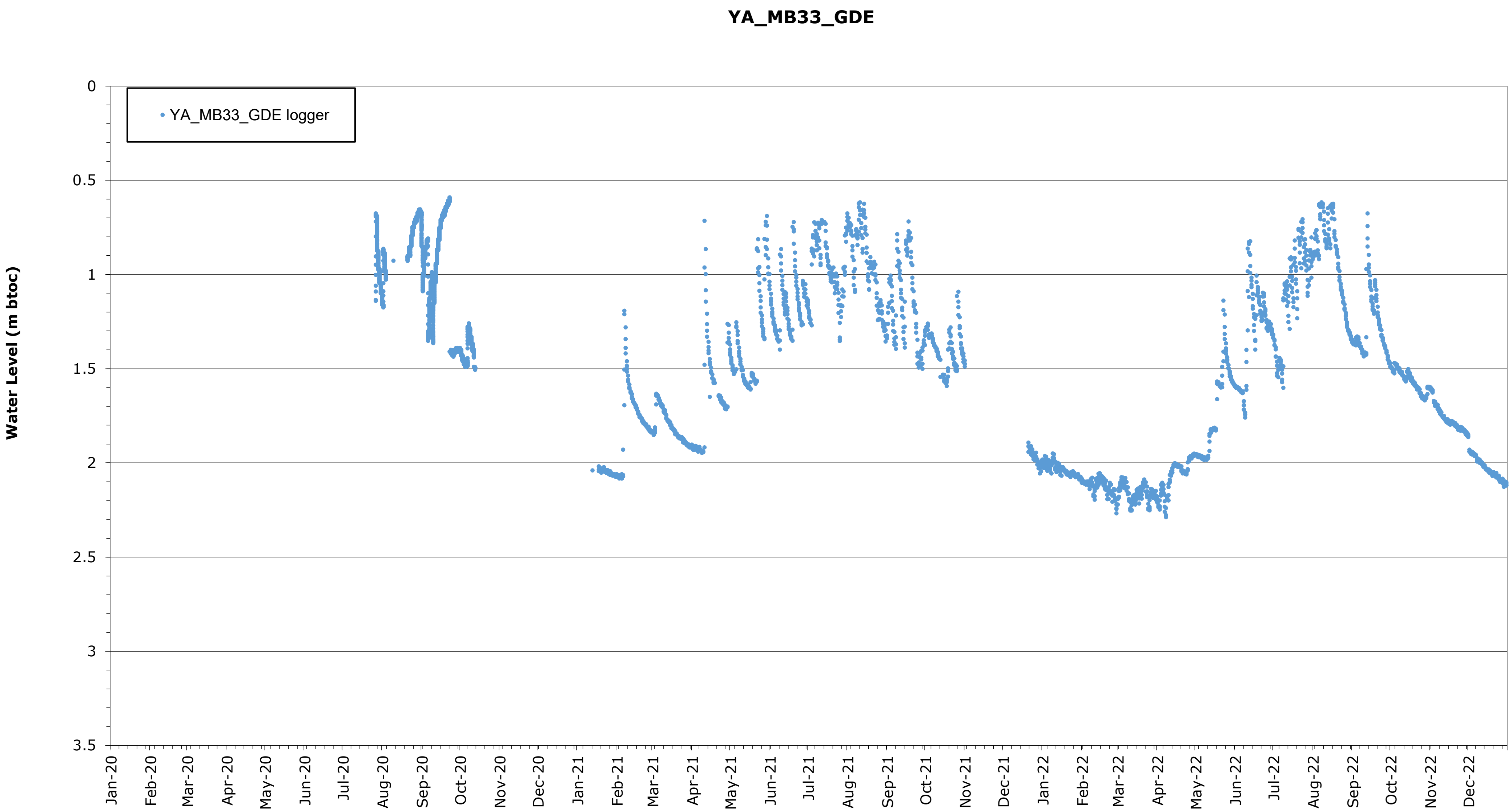






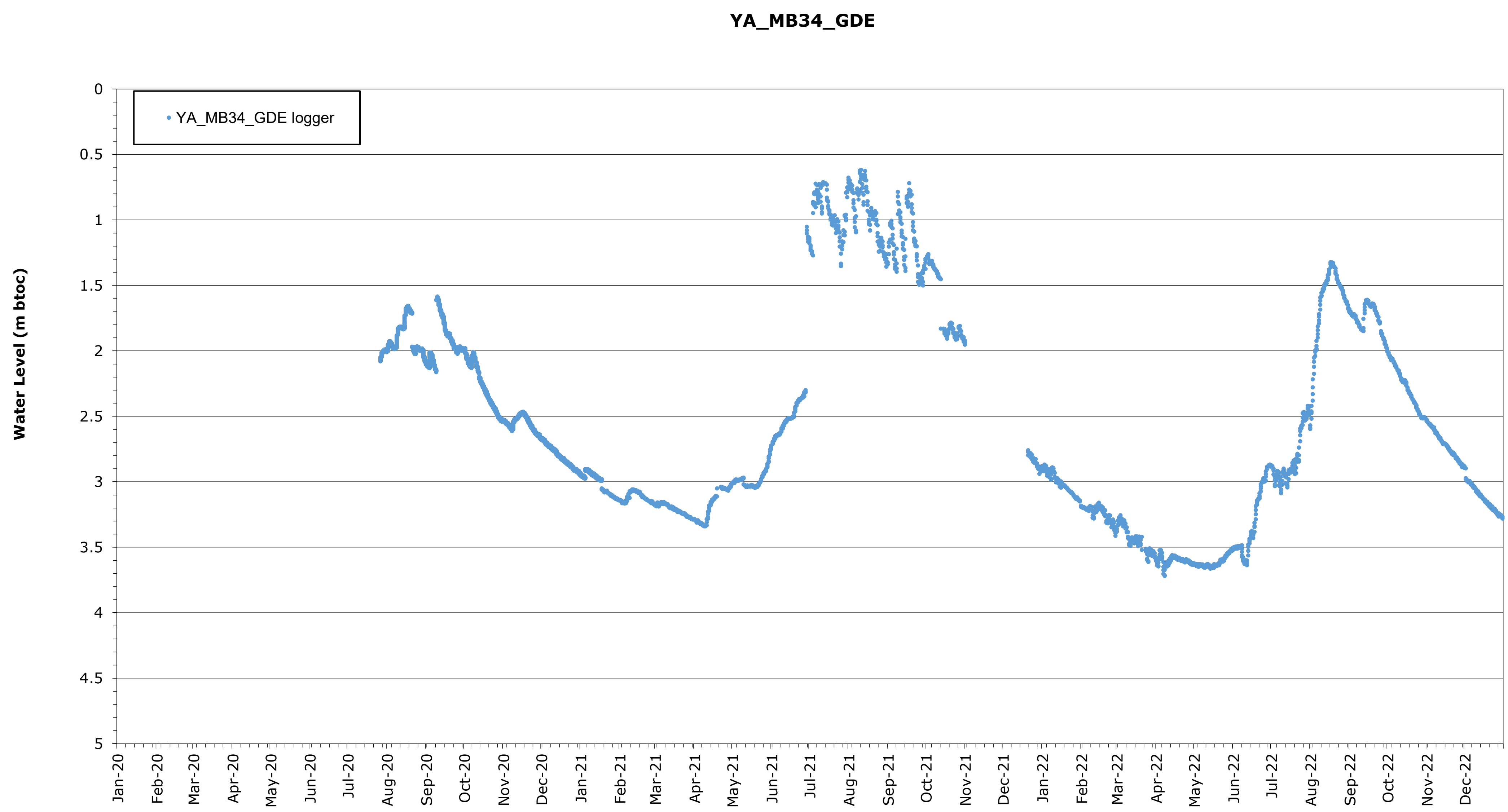
AQ2

BOREFIELD DEWATERING AND WATER LEVEL DATA YAMB33 GDE A, YAMB34 GDE B, YAMB35 GDE C, YAMB36 GDE D AND YAMB37 GDE E, JANUARY TO DECEMBER 2022 FIGURE 10e



AQ2

GDE MONITORING BORE YA_MB33_GDE WATER LEVELS (mbtoc)
Figure 11a



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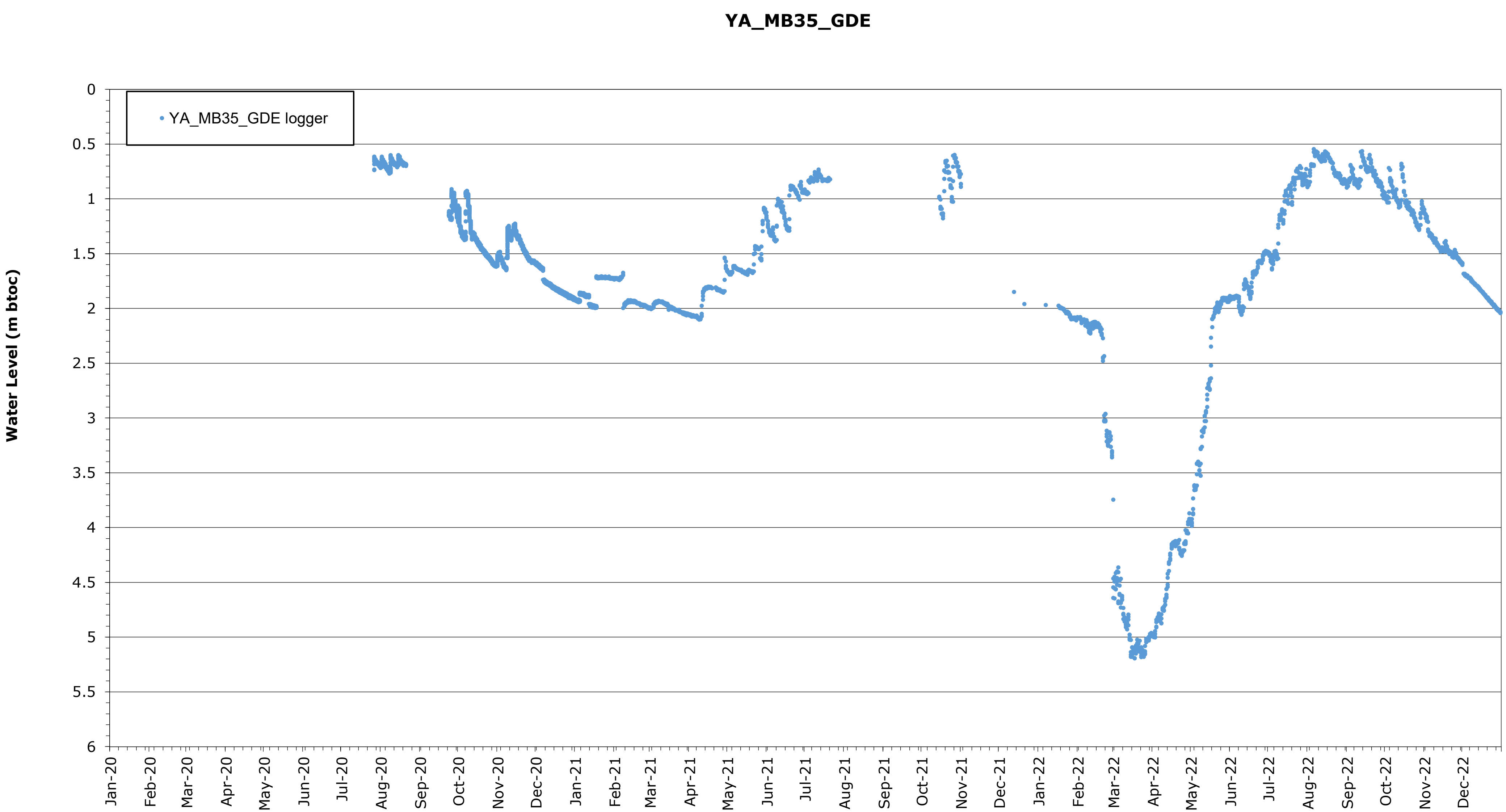
GDE MONITORING BORE YA_MB34_GDE WATER LEVELS (mbtoc)
Figure 11b



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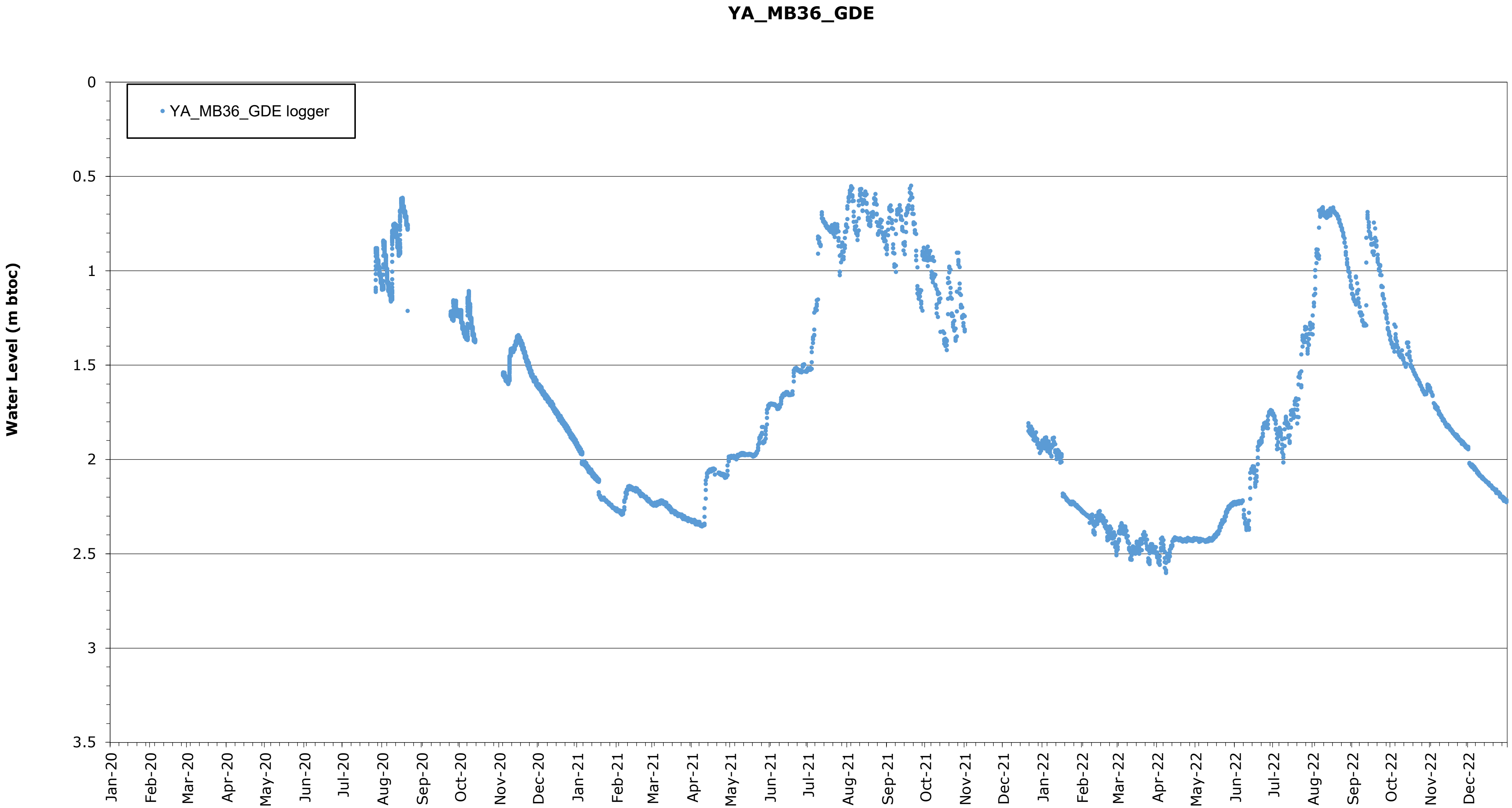
GDE MONITORING BORE YA_MB35_GDE WATER LEVELS (mbtoc)
Figure 11c



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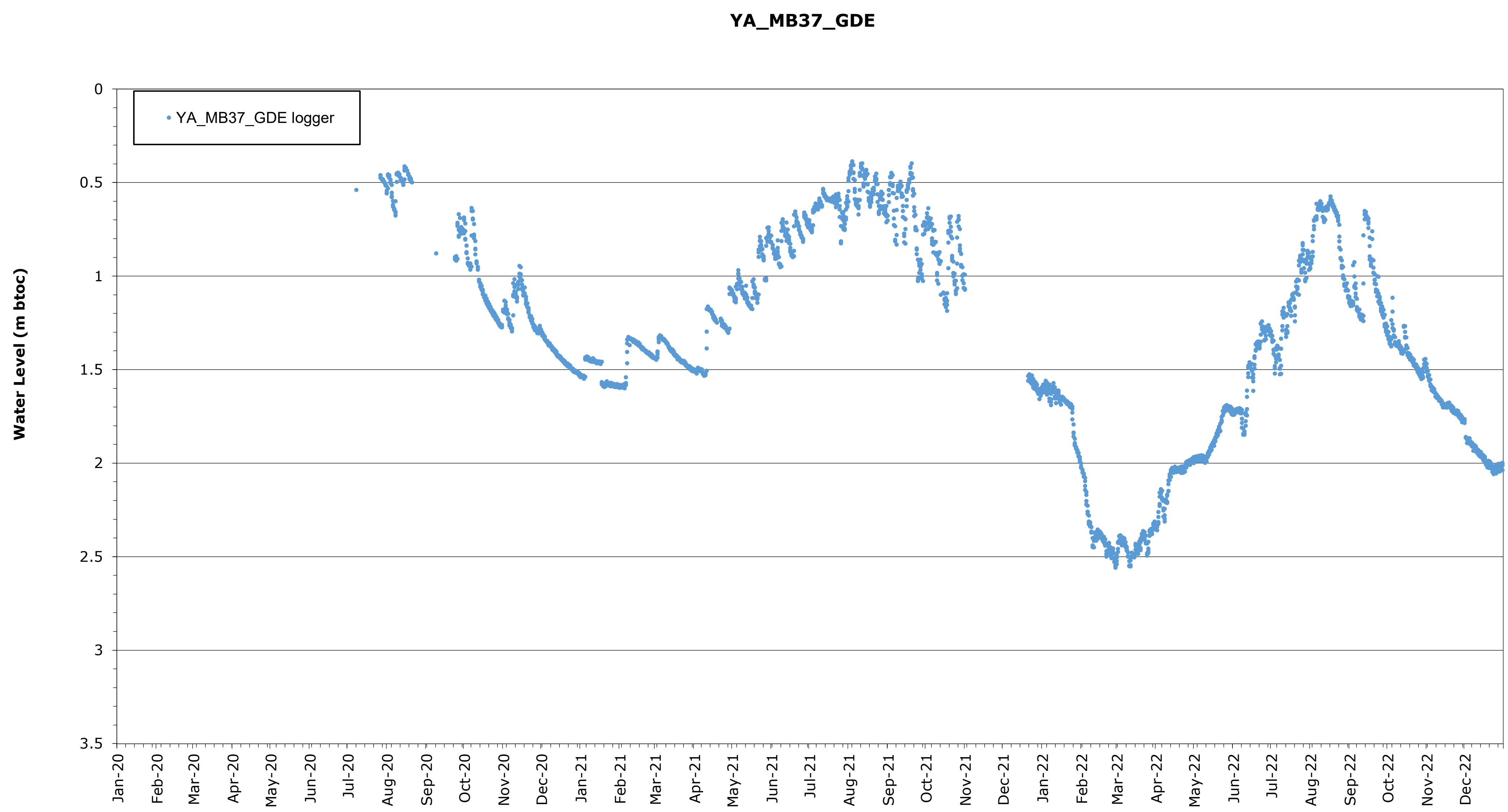

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GDE MONITORING BORE YA_MB37_GDE WATER LEVELS (mbtoc)
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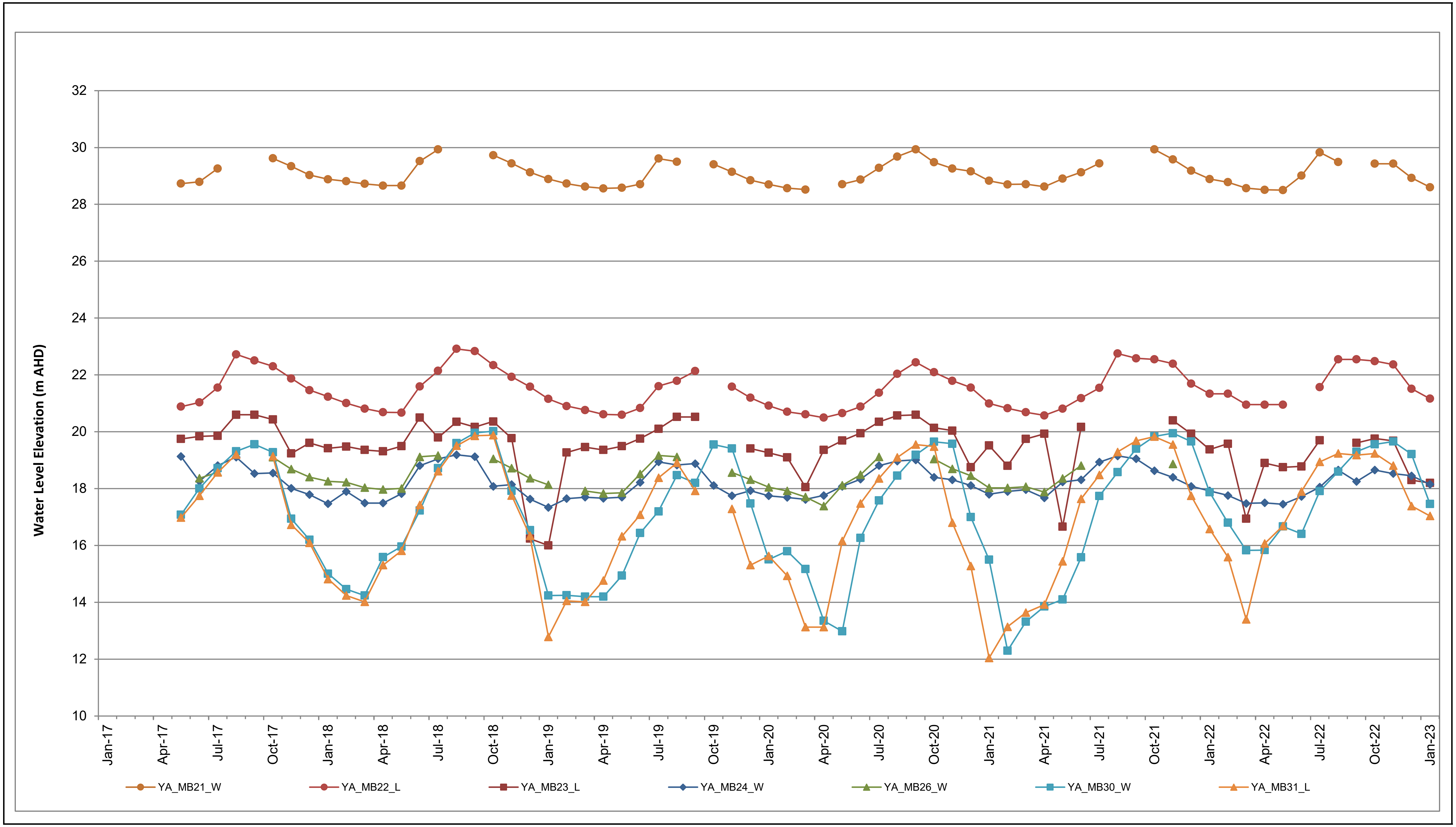
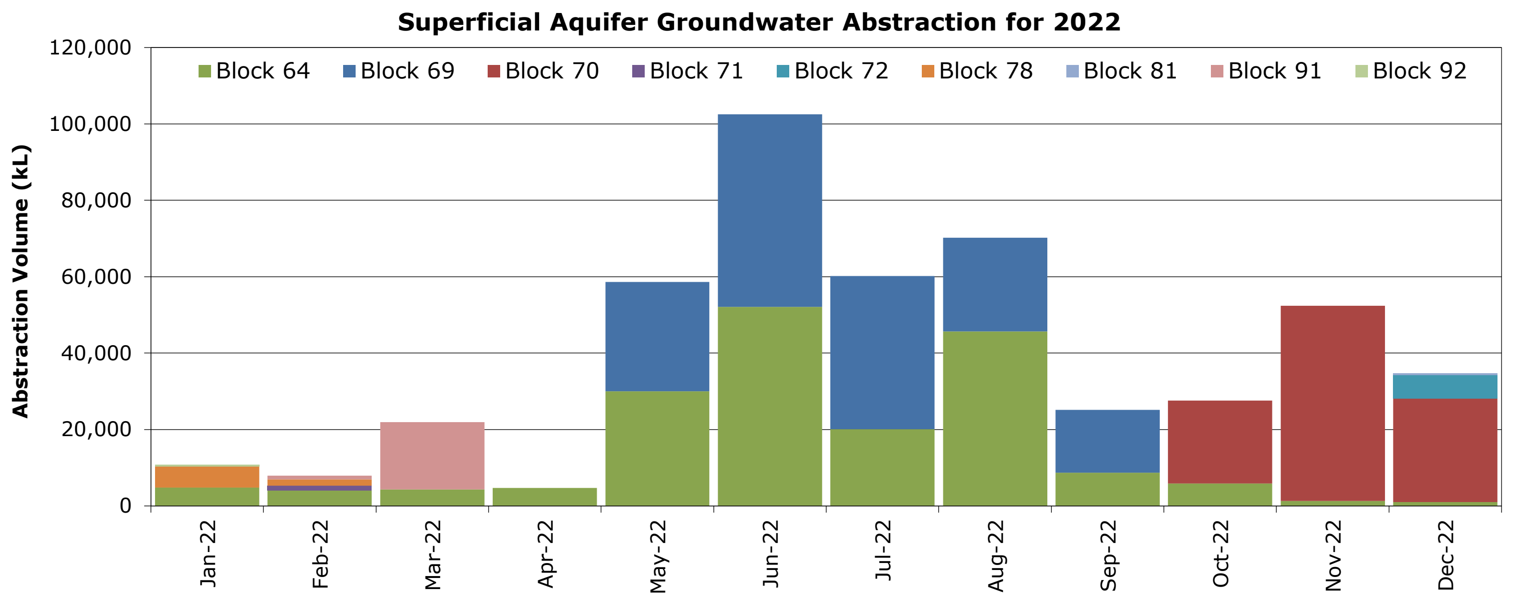
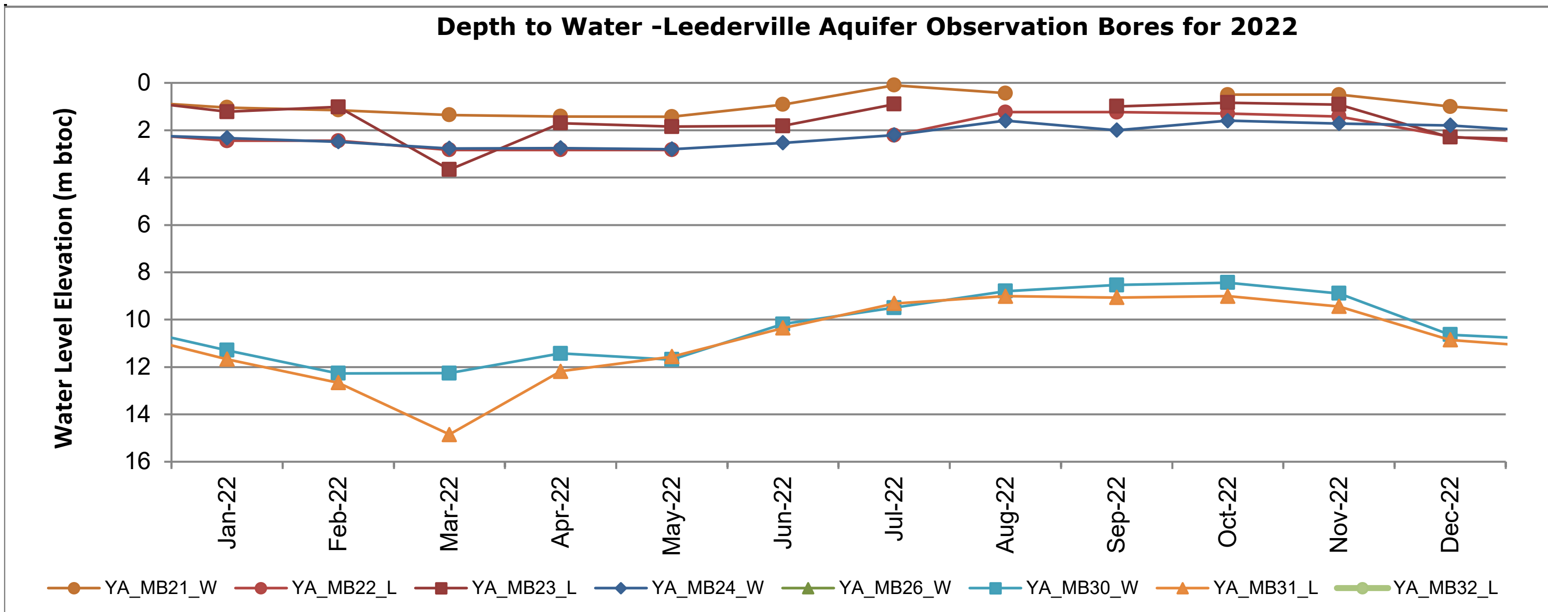
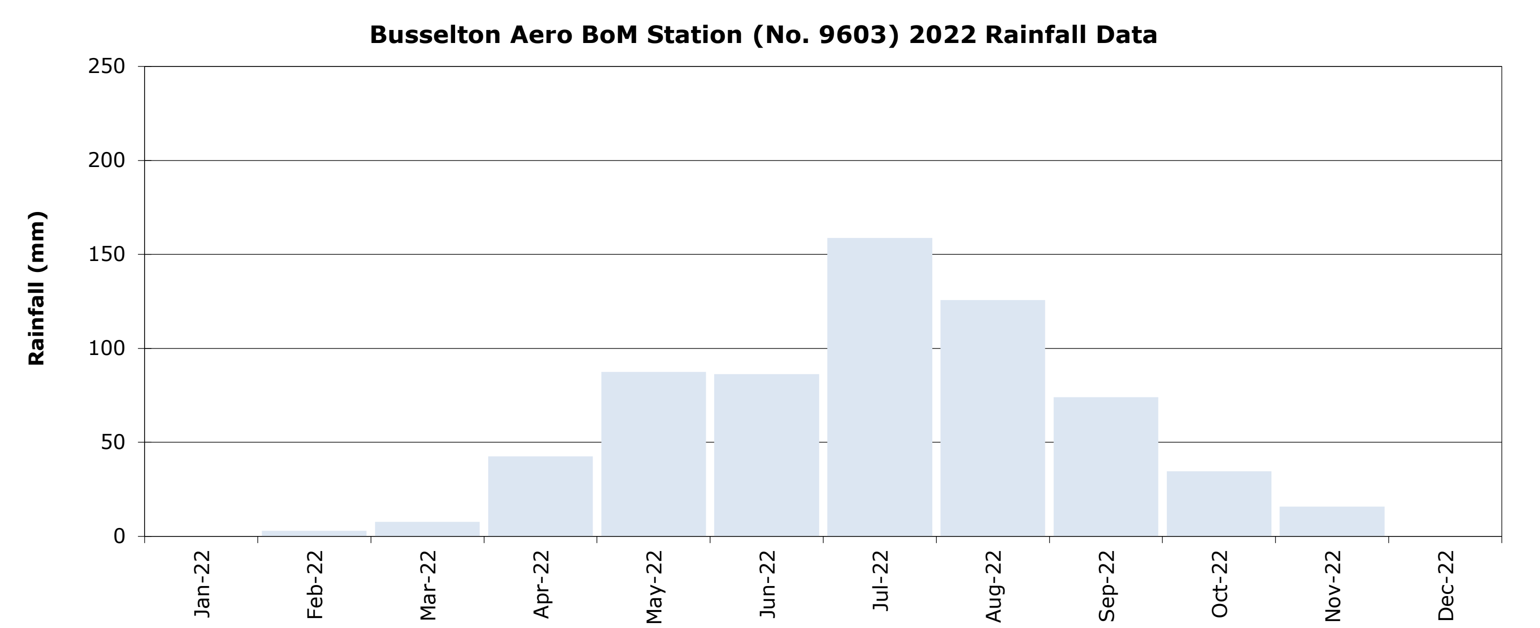


AQ2

Monitoring Bore Water Level Elevations m AHD (Leederville Aquifer) FIGURE 12

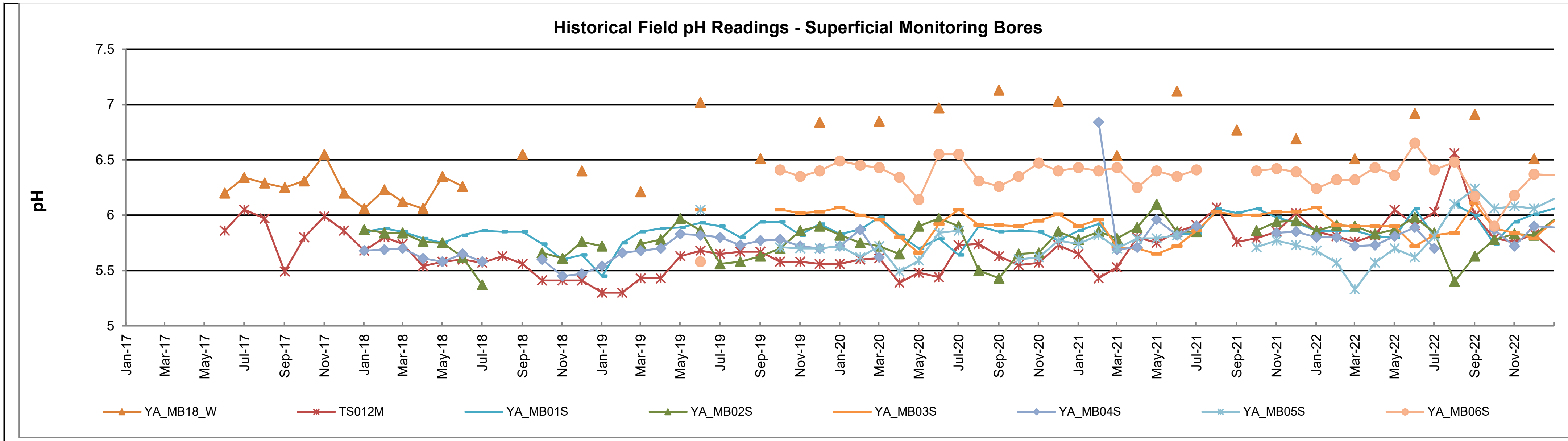


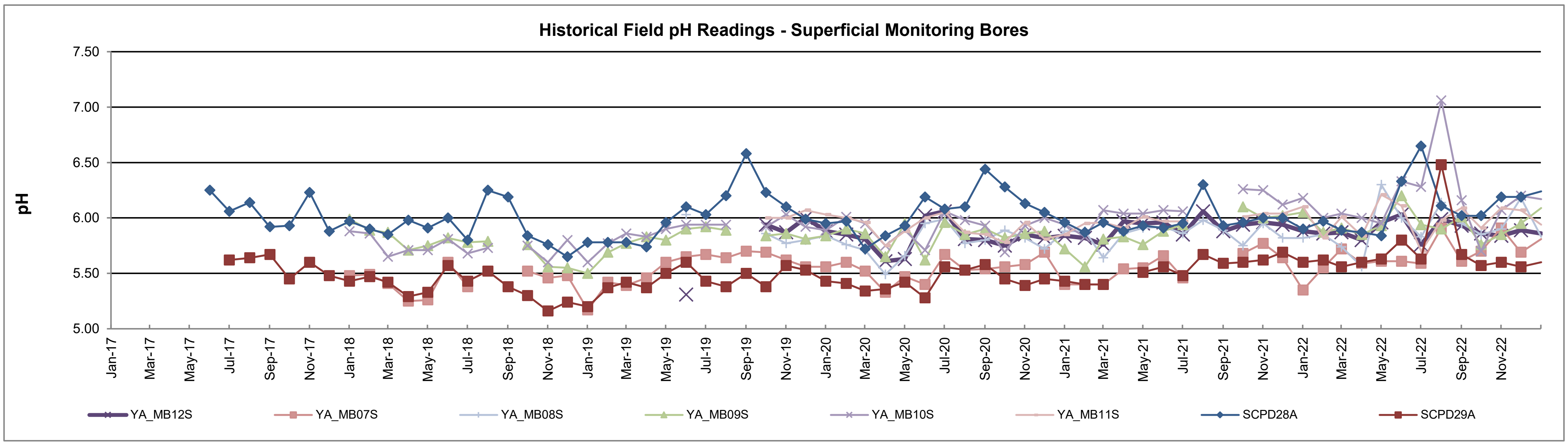




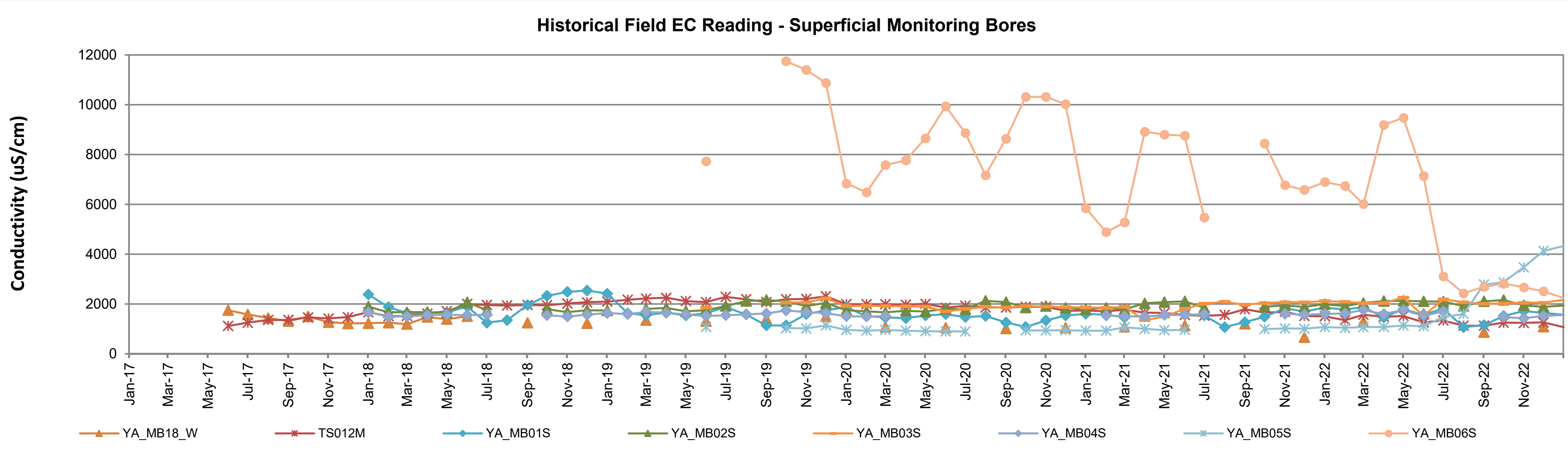
AQ2

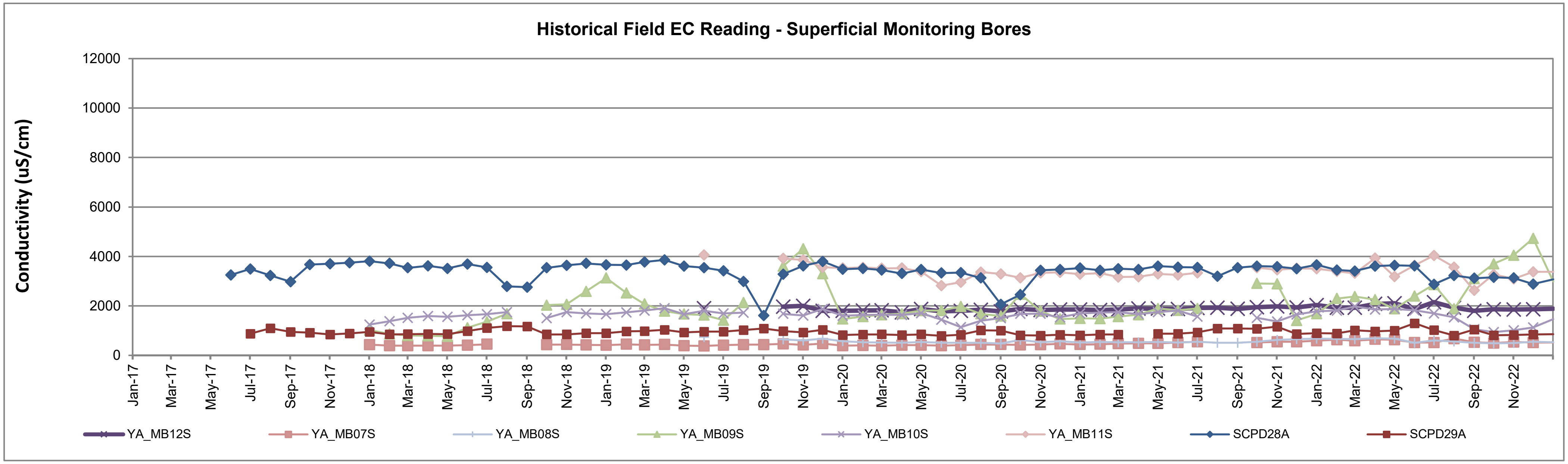
BOREFIELD DEWATERING AND LEEDERVILLE AQUIFER WATER LEVEL DATA, JANUARY TO DECEMBER 2022 FIGURE 13





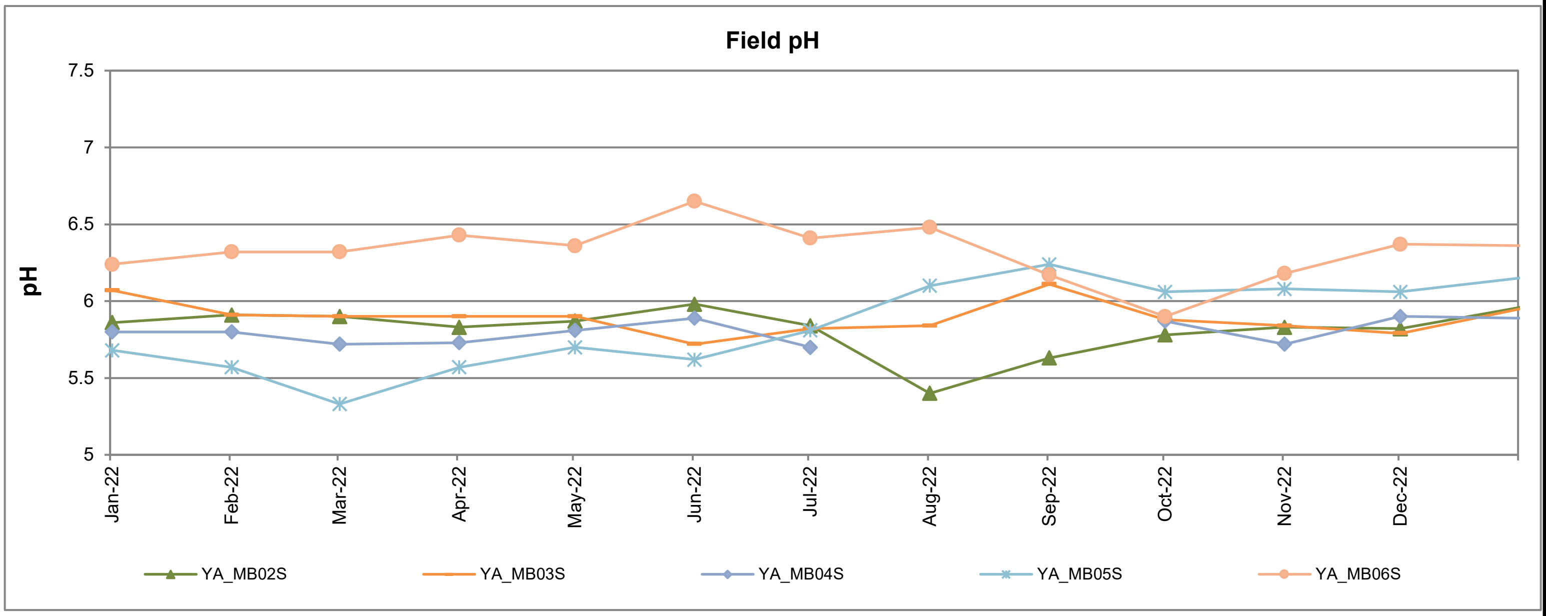
HISTORICAL FIELD pH DATA (SUPERFICIAL AQUIFER) FIGURE 14

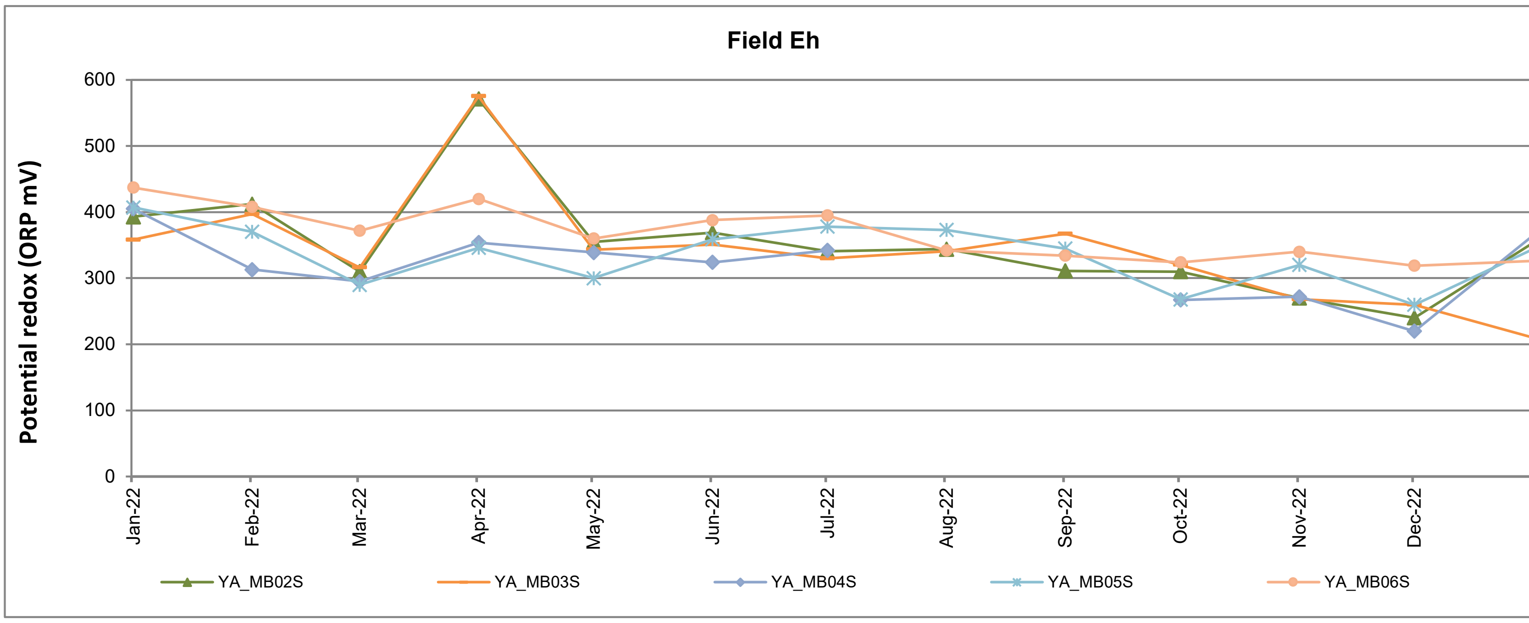


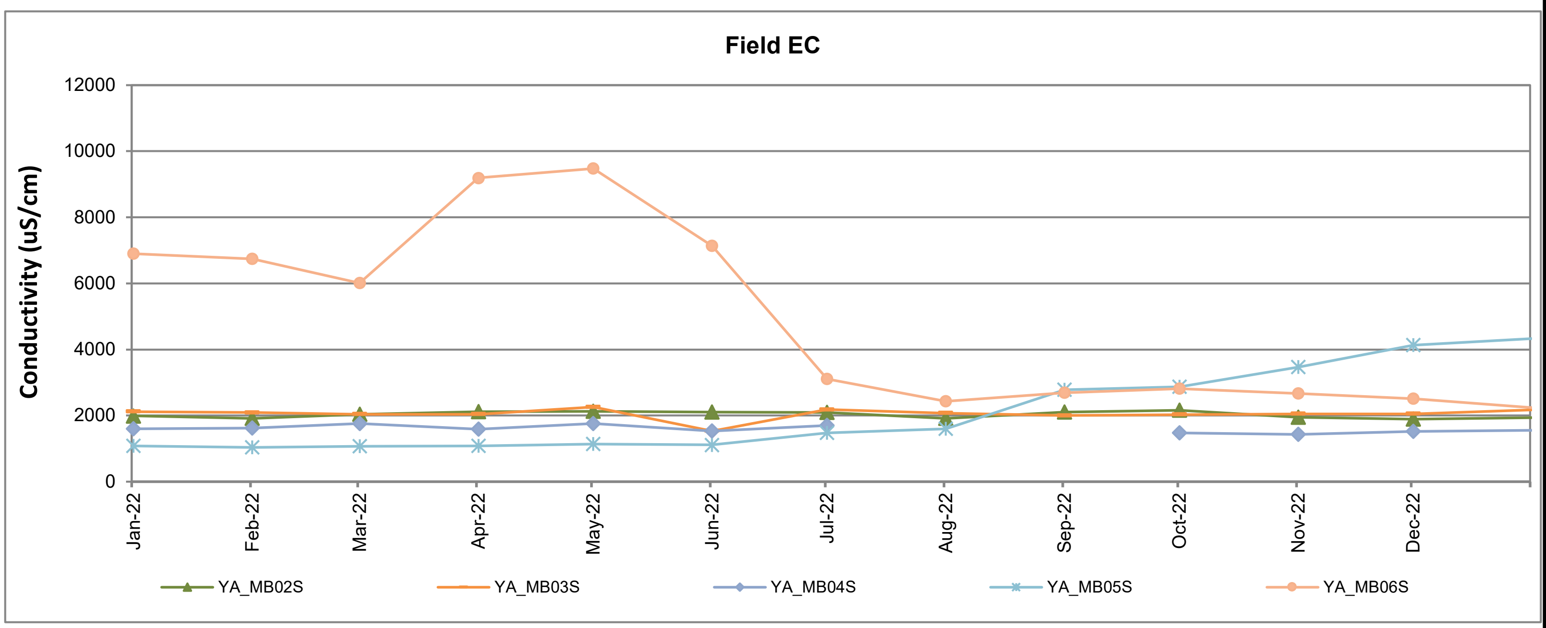


AQ2

HISTORICAL FIELD CONDUCTIVITY (EC) DATA (SUPERFICIAL AQUIFER) FIGURE 15

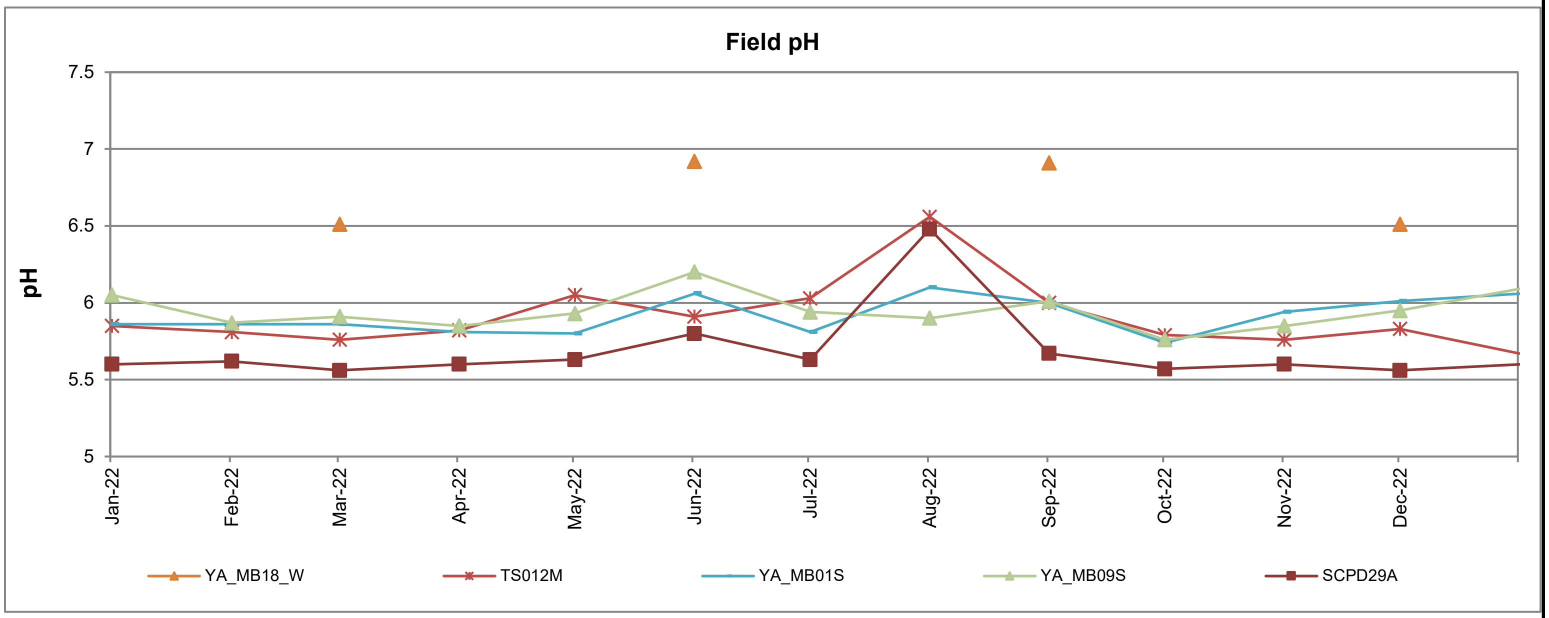


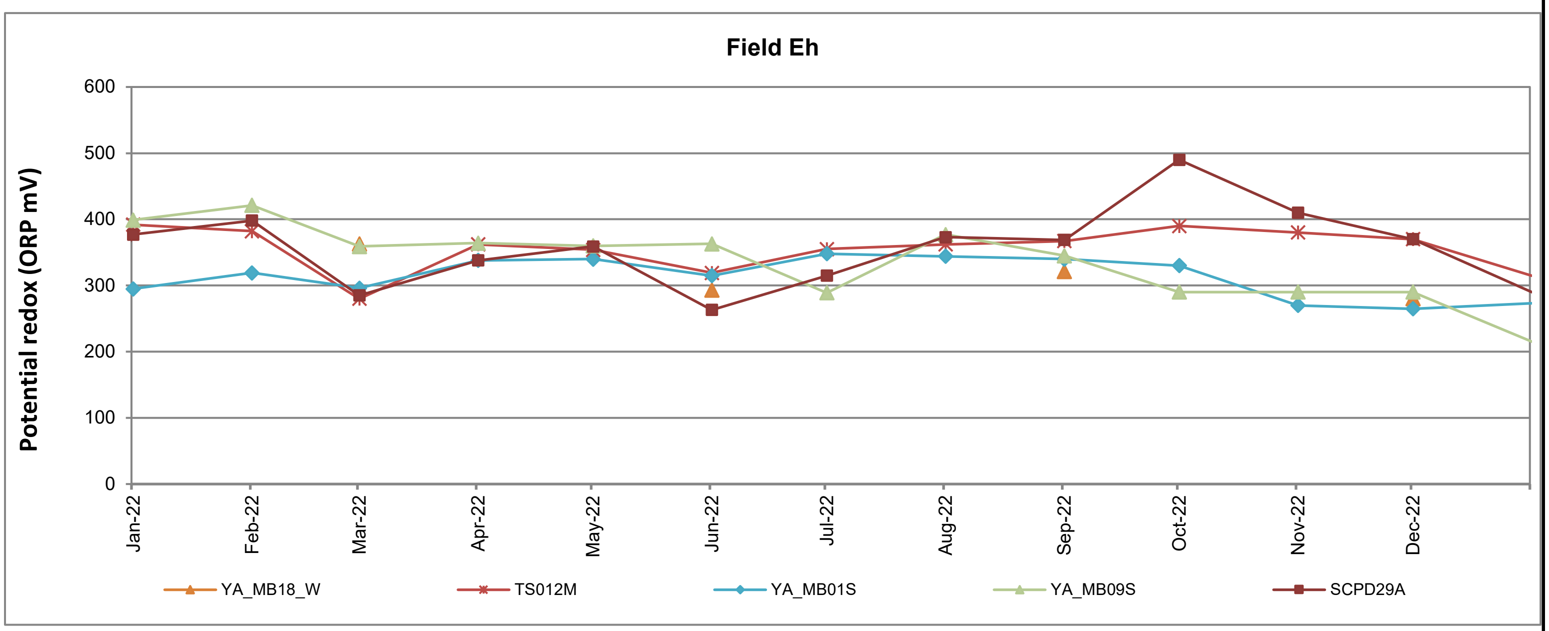


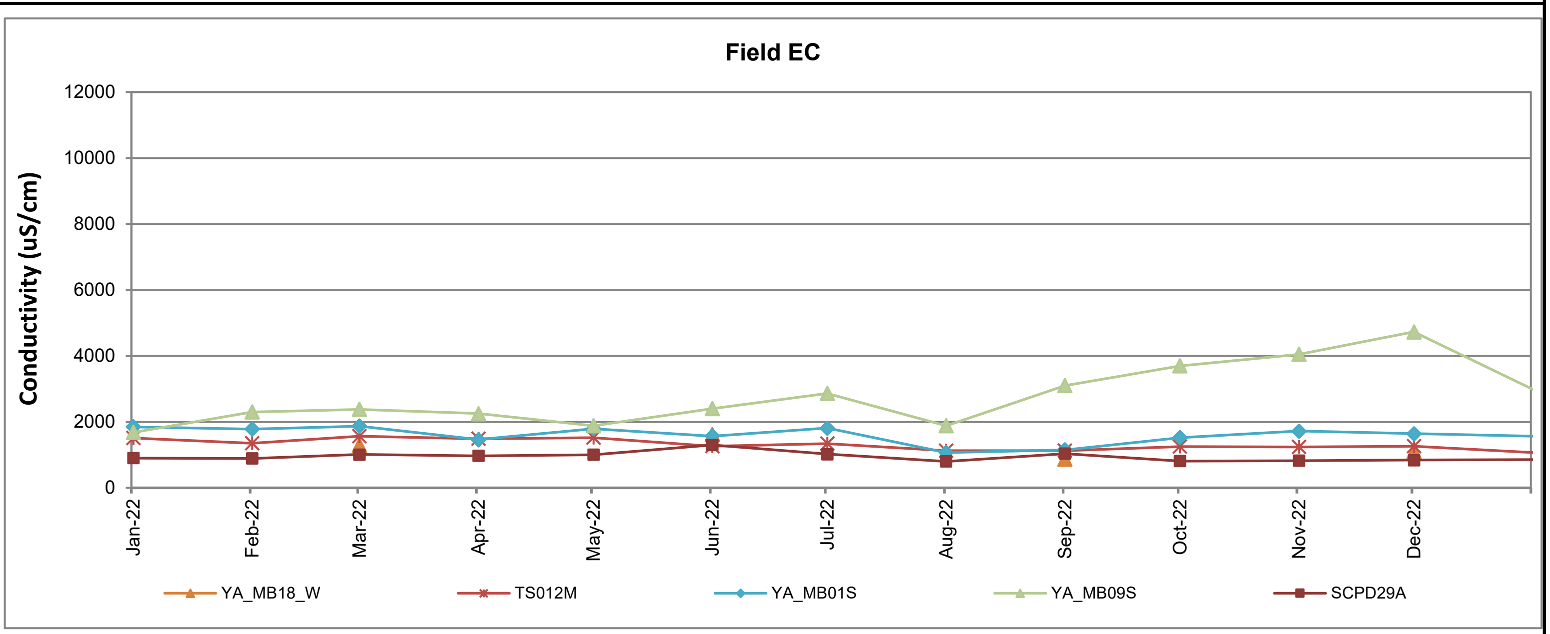


AQ2

FIELD CHEMISTRY (pH, Eh, EC) YAMB02S, YAMB03S, YAMB04S, YAMB05S AND YAMB06S, JANUARY TO DECEMBER 2022 FIGURE 16a

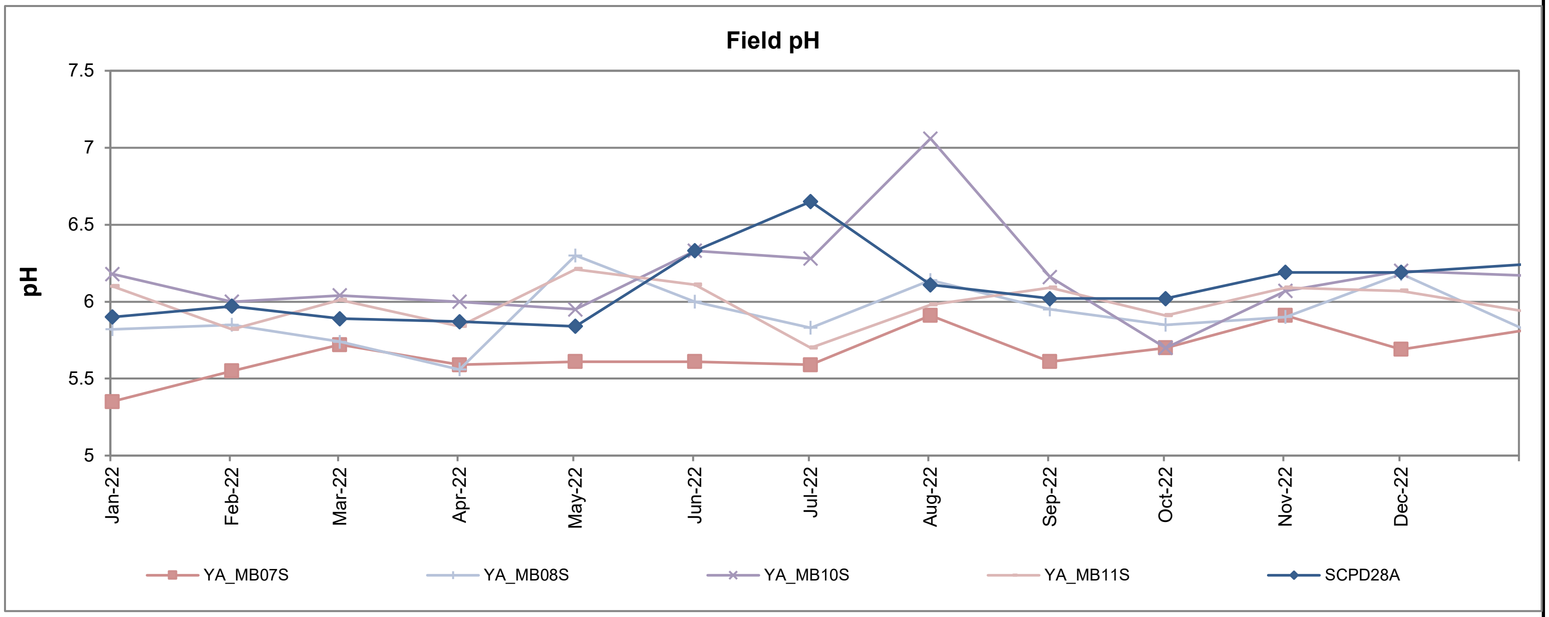


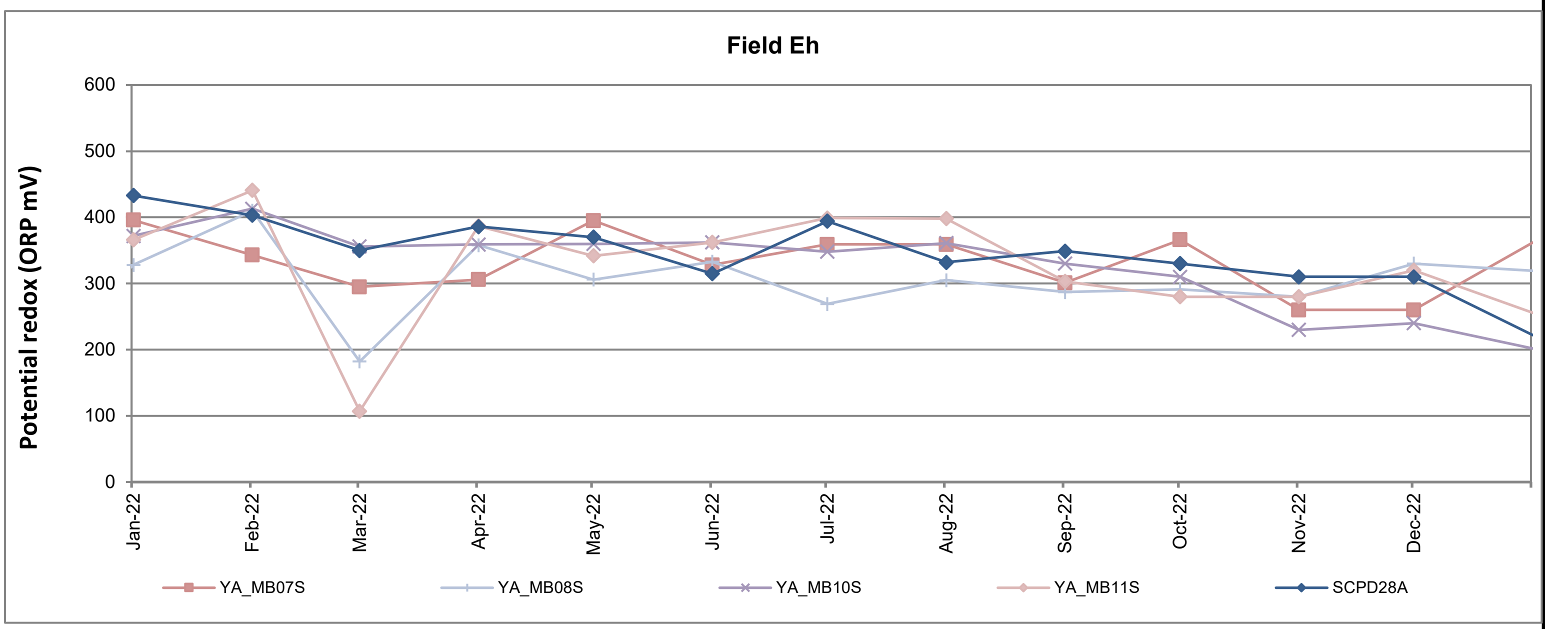


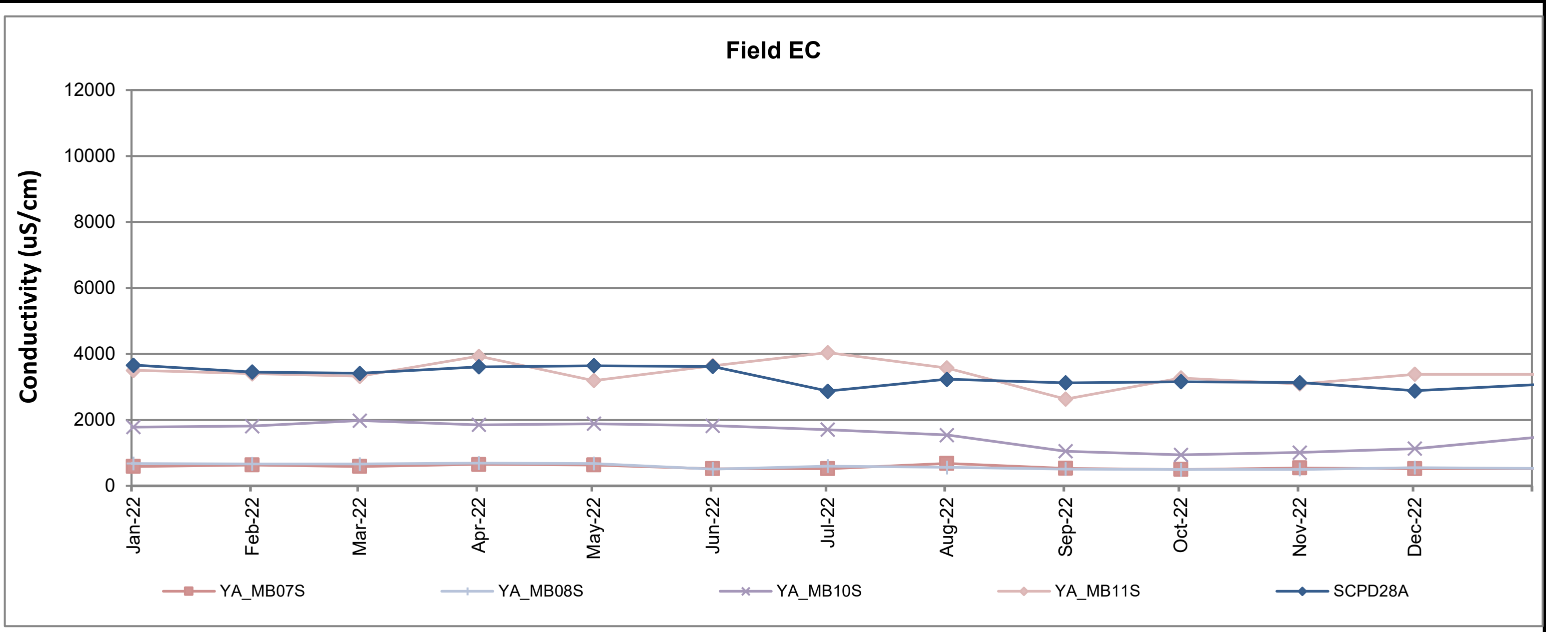


AQ2

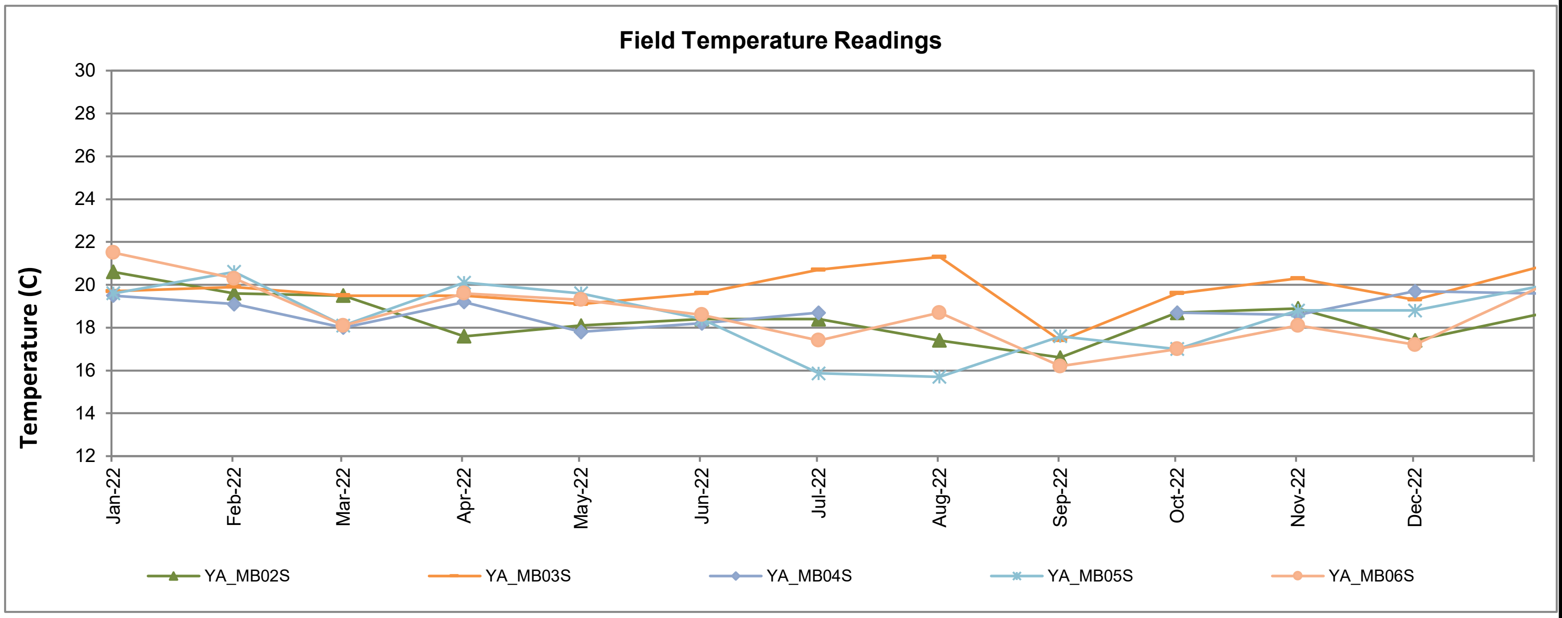
FIELD CHEMISTRY (pH, Eh, EC) YAMB18W, TS01M, YAMB01S, YAMB09S AND SCPD29A, JANUARY TO DECEMBER 2022 FIGURE 16b

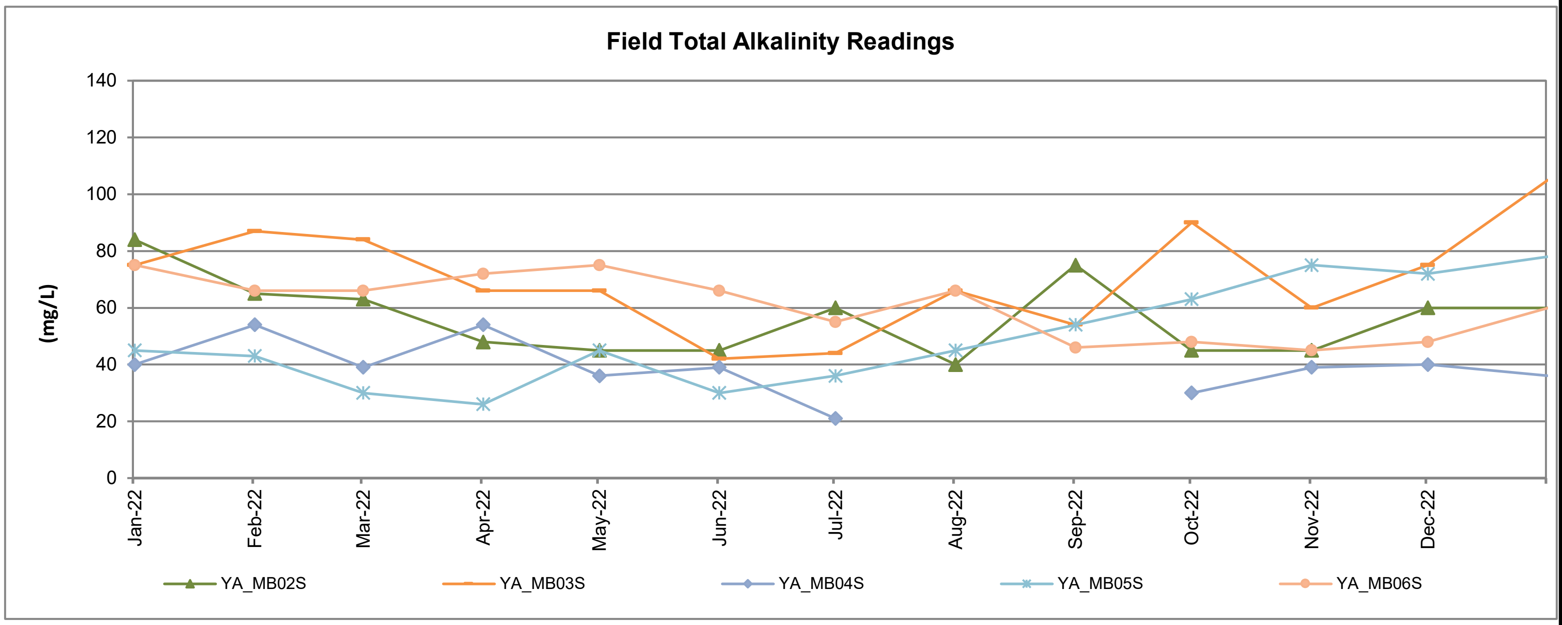


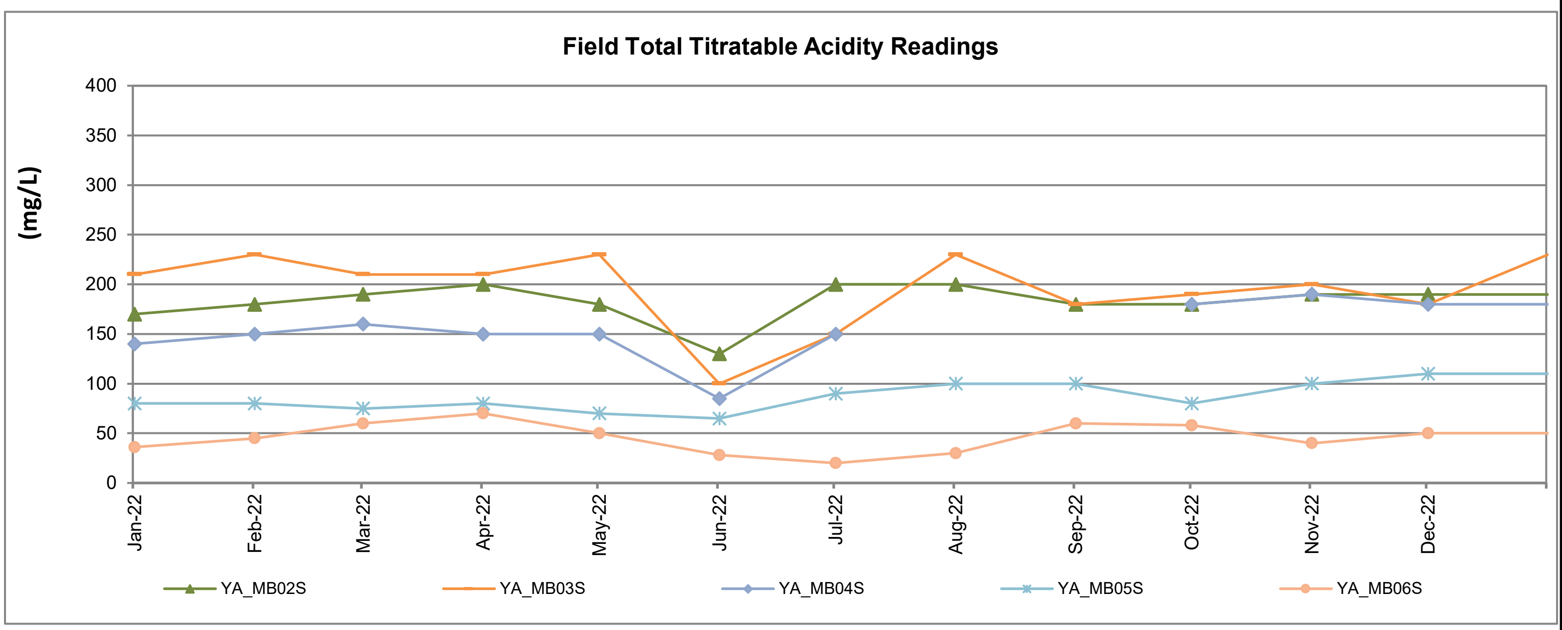




FIELD CHEMISTRY (pH, Eh, EC) YAMB07S, YAMB08S, YAMB10S, YAMB11S AND SCPD28A, JANUARY TO DECEMBER 2022 FIGURE 16c

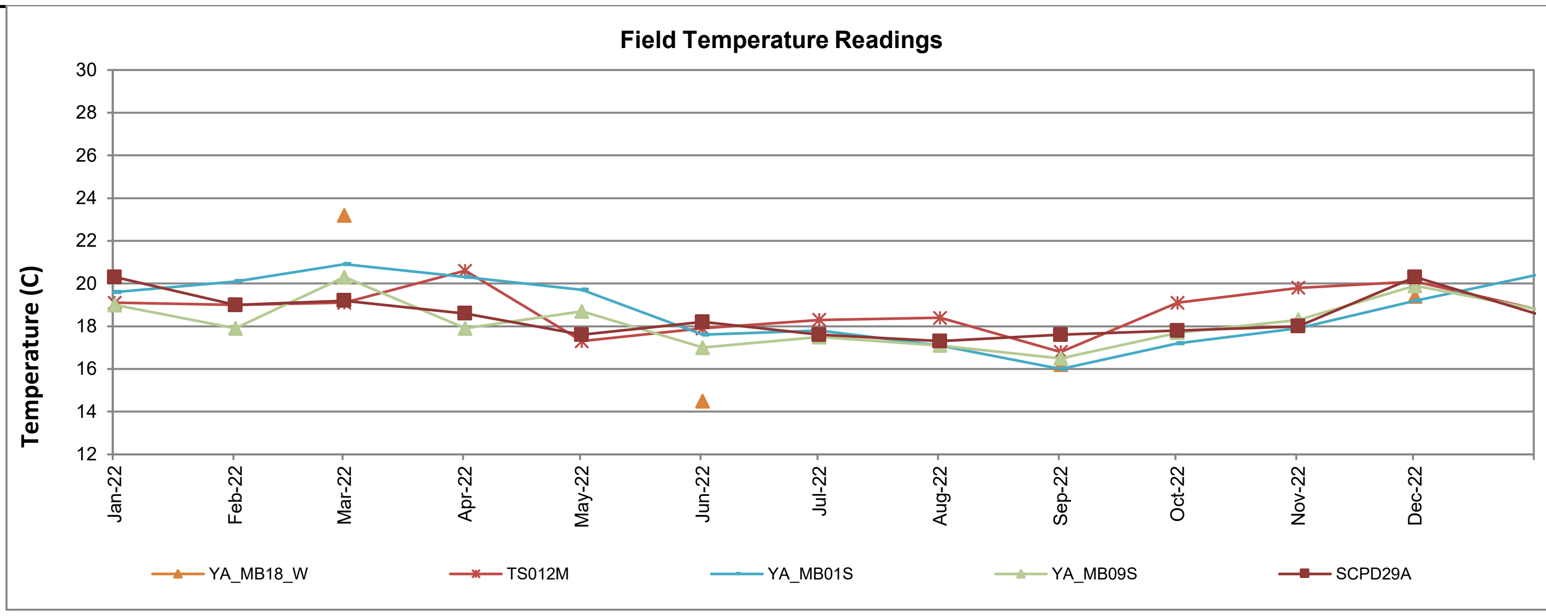


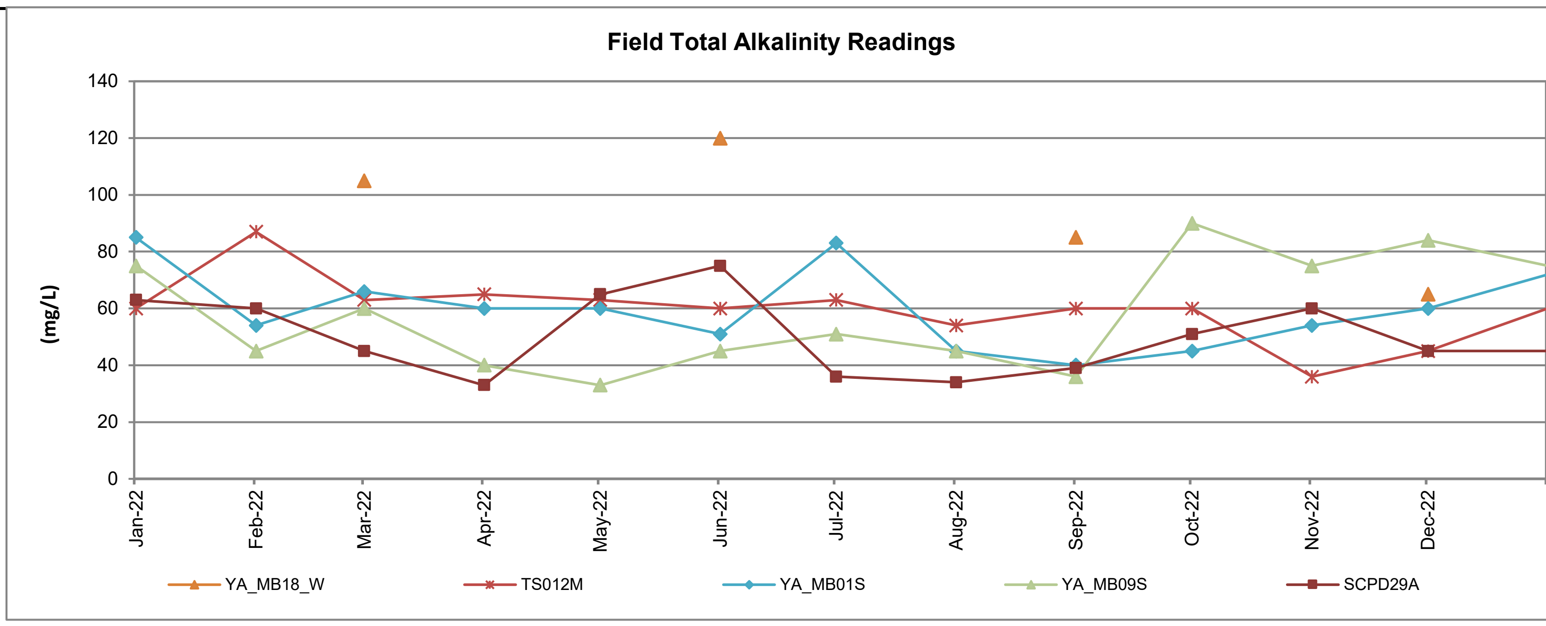


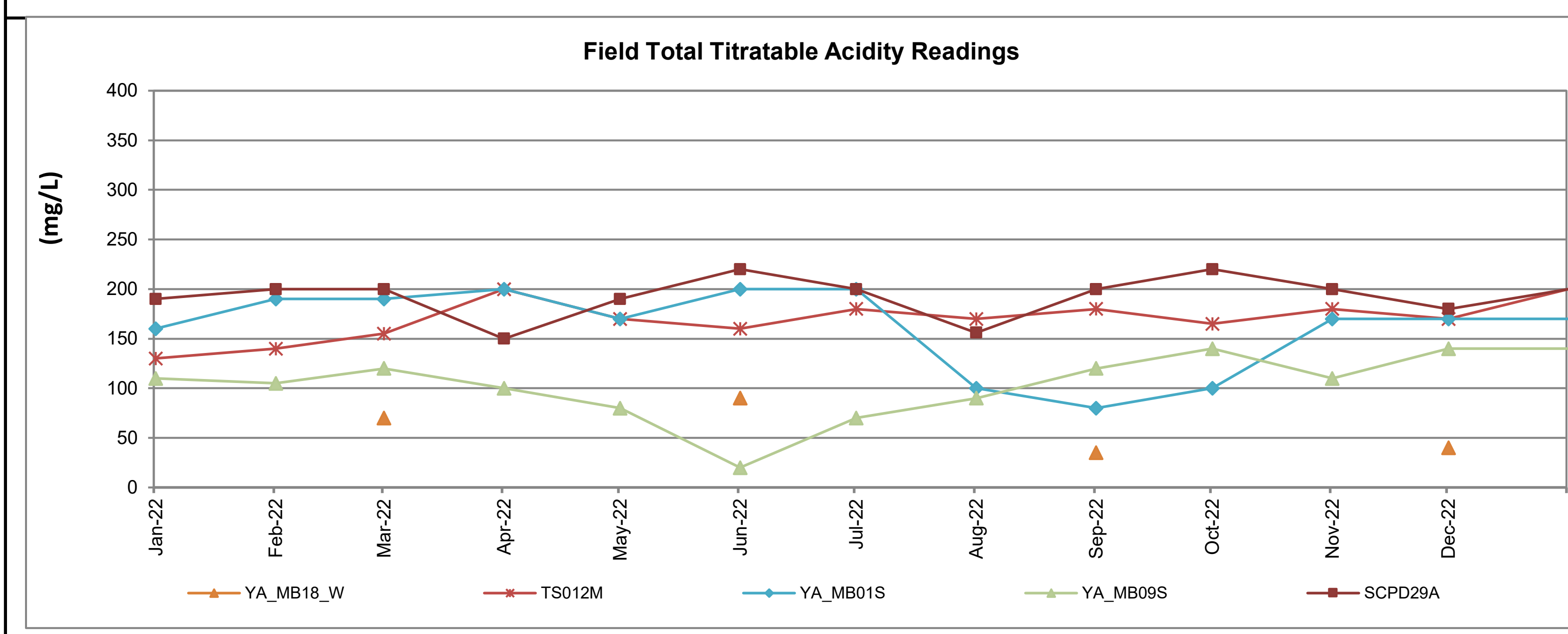


AQ2

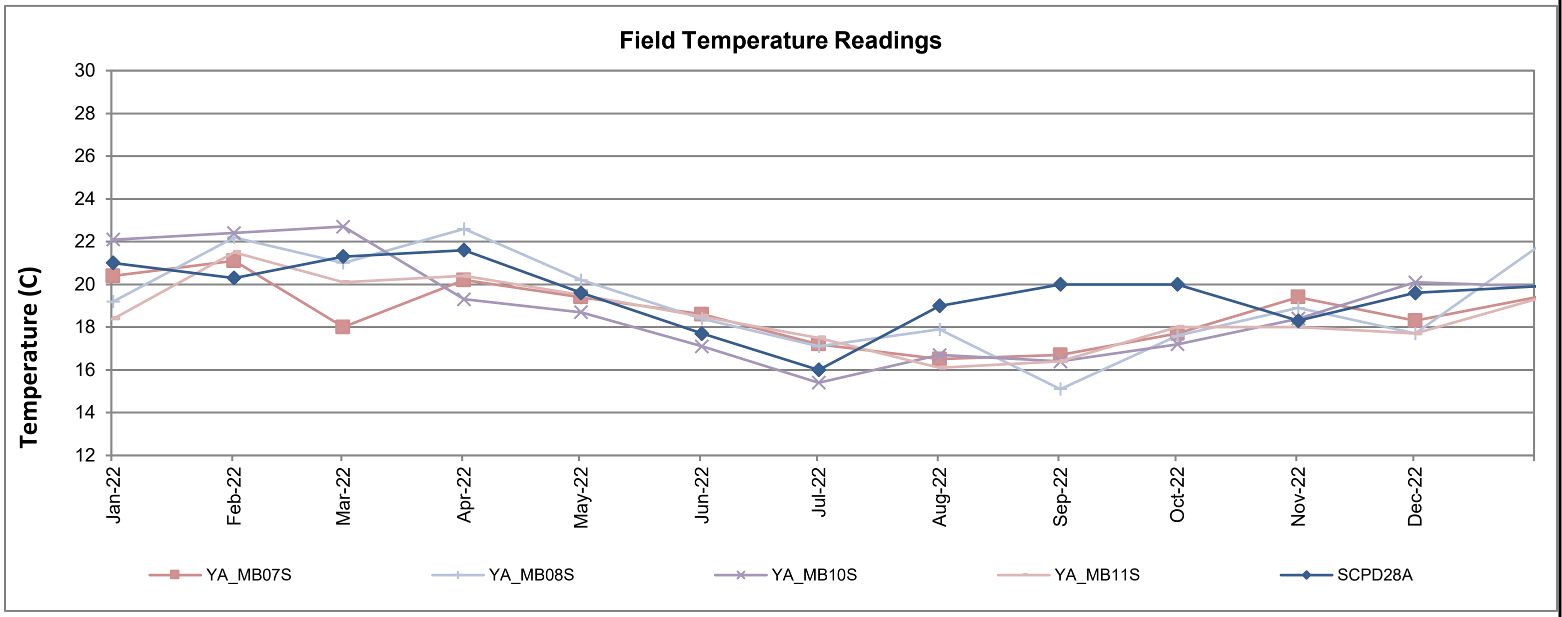
FIELD CHEMISTRY (TEMP, TOTAL TITRATABLE ACIDITY , TOTAL ALKALITY) YAMB02S, YAMB03S, YAMB04S, YAMB05S AND YAMB06S, JANUARY TO DECEMBER 2022 FIGURE 17a

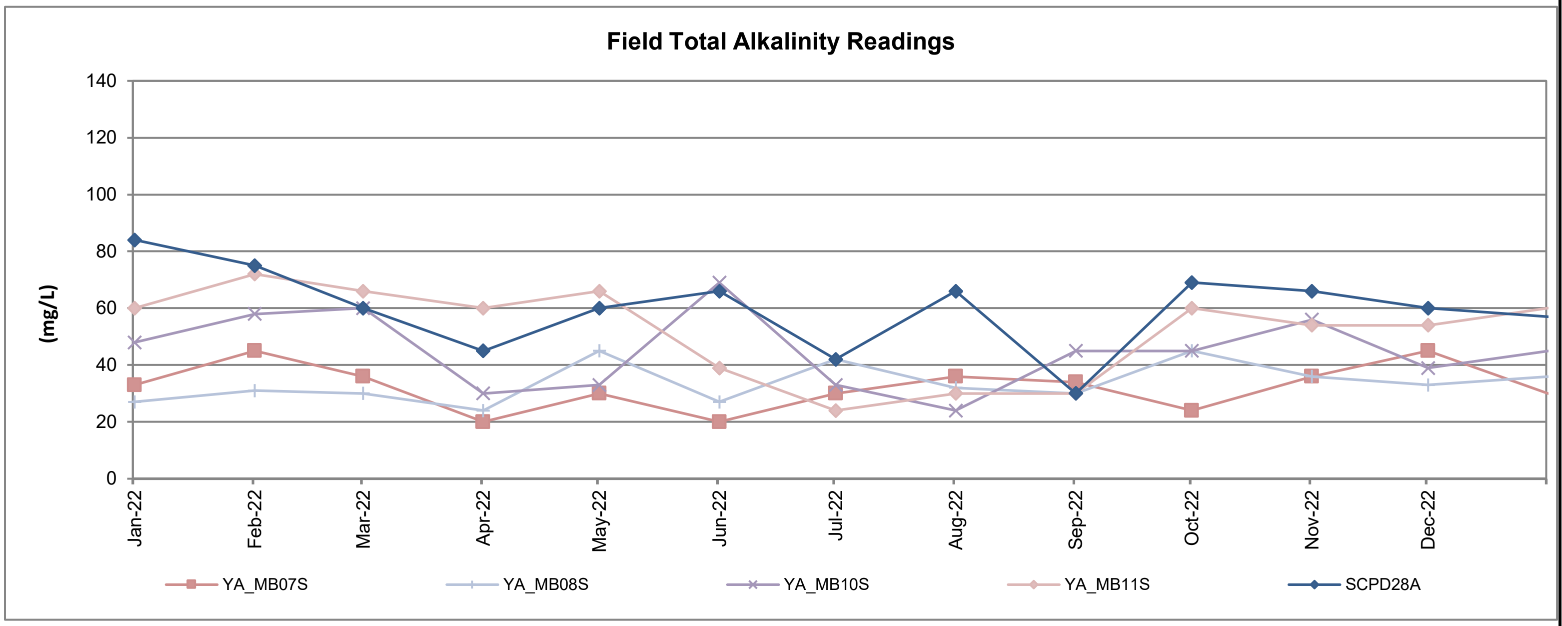


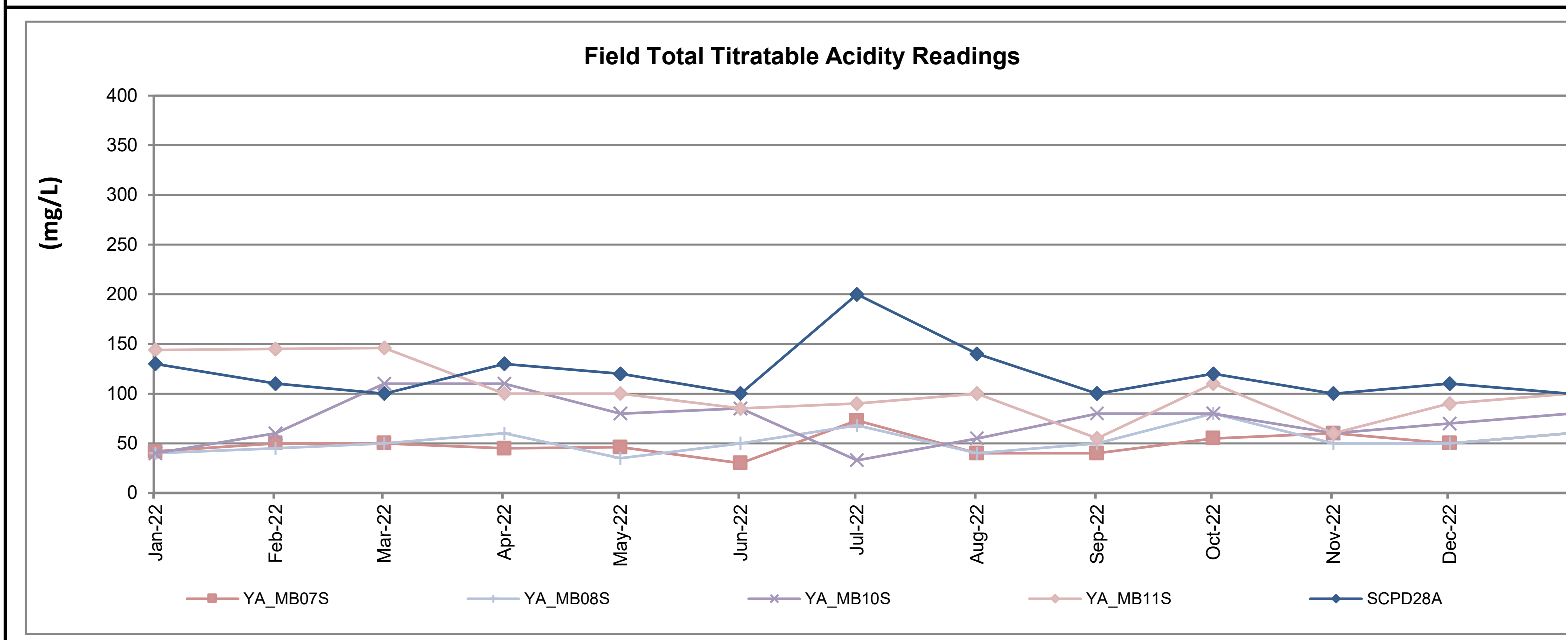




FIELD CHEMISTRY (TEMP, TOTAL TITRATABLE ACIDITY , TOTAL ALKALITYYAMB09S AND SCPD29A, JANUARY TO DECEMBER 2022 FIGURE 17b

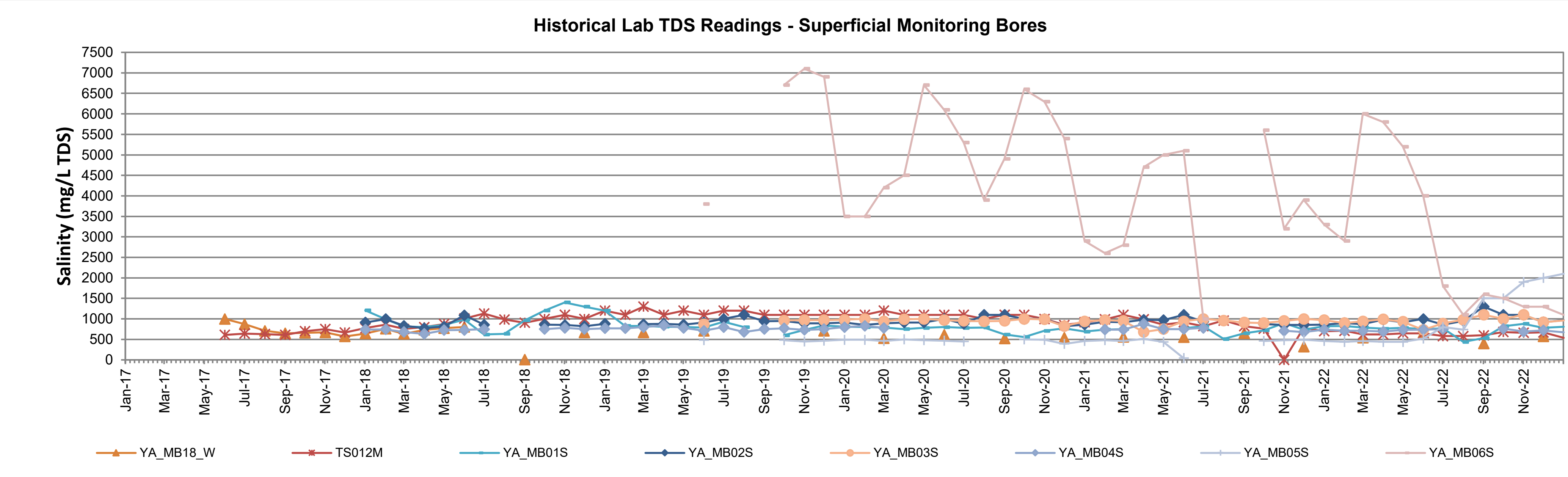


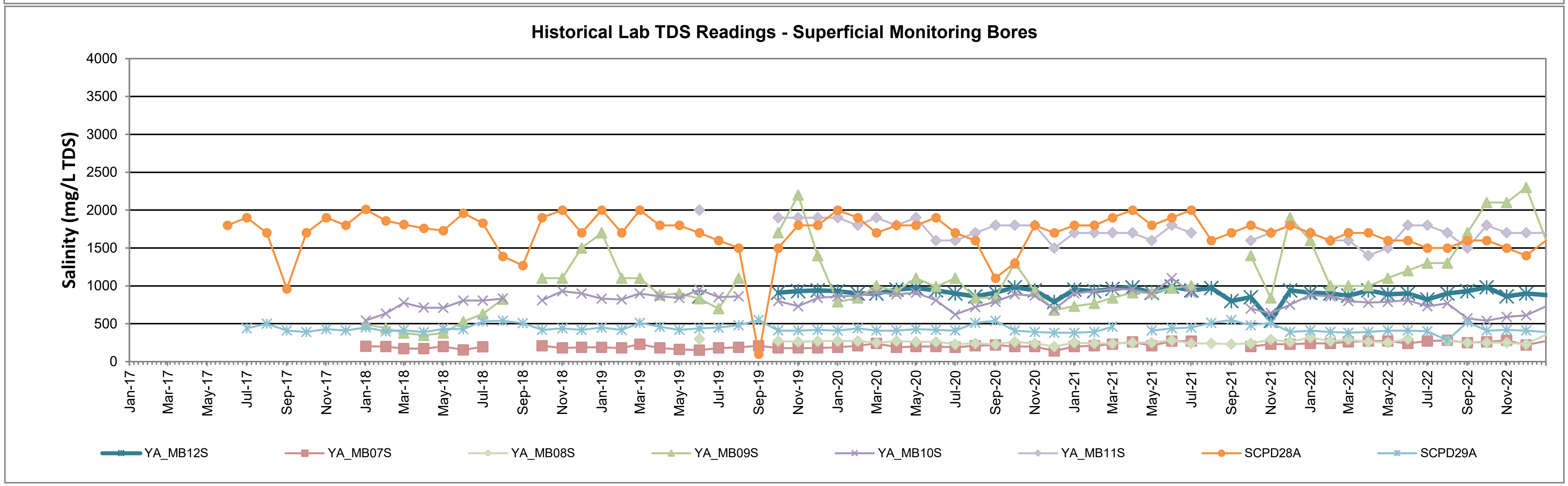




AQ2

FIELD CHEMISTRY (TEMP, TOTAL TITRATABLE ACIDITY , TOTAL ALKALITY) YAMB07S, YAMB08S, YAMB10S, YAMB11S AND SCPD28A, JANUARY TO DECEMBER 2022 FIGURE 17c





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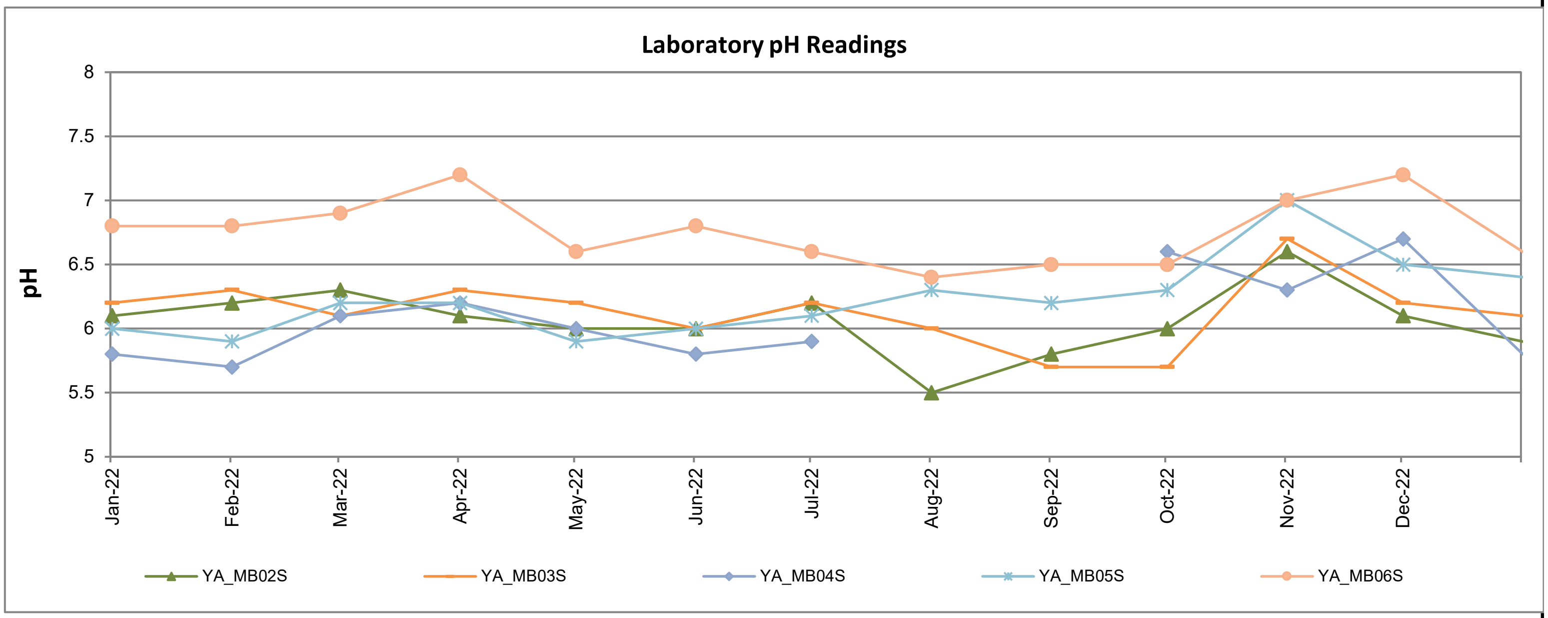
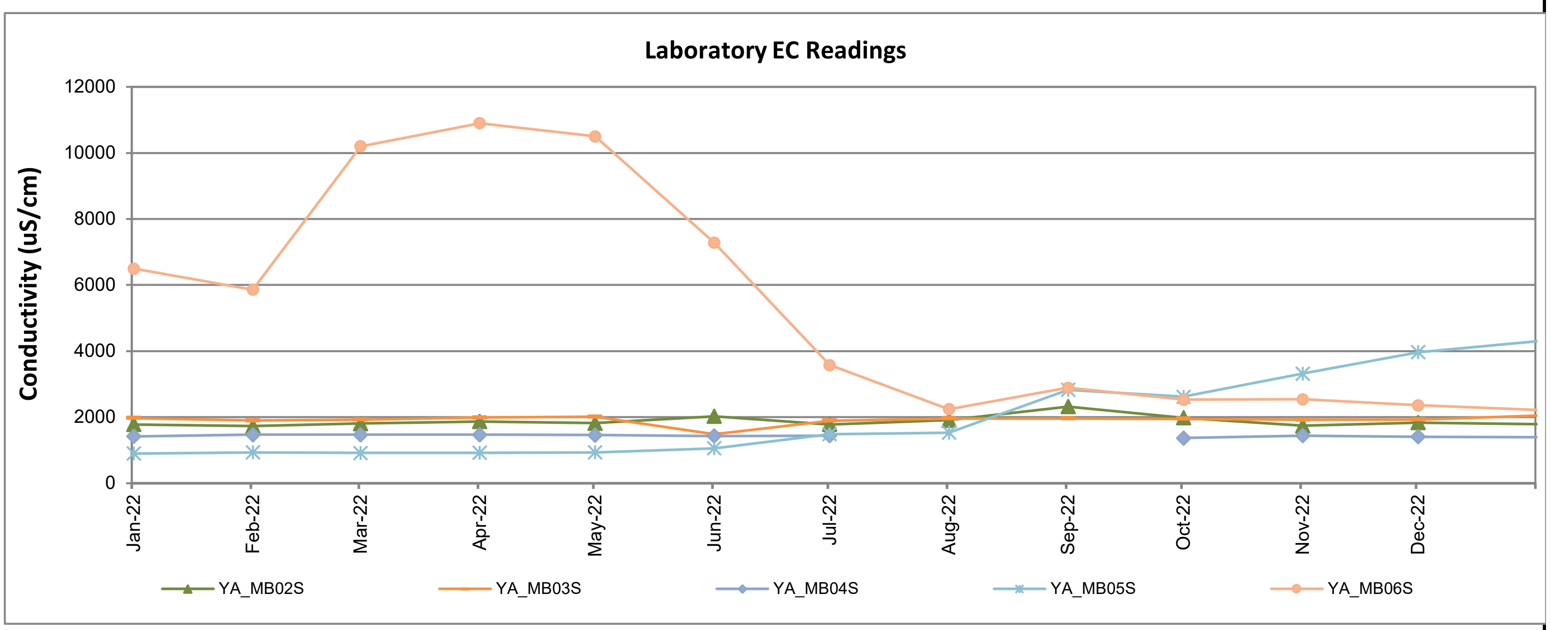
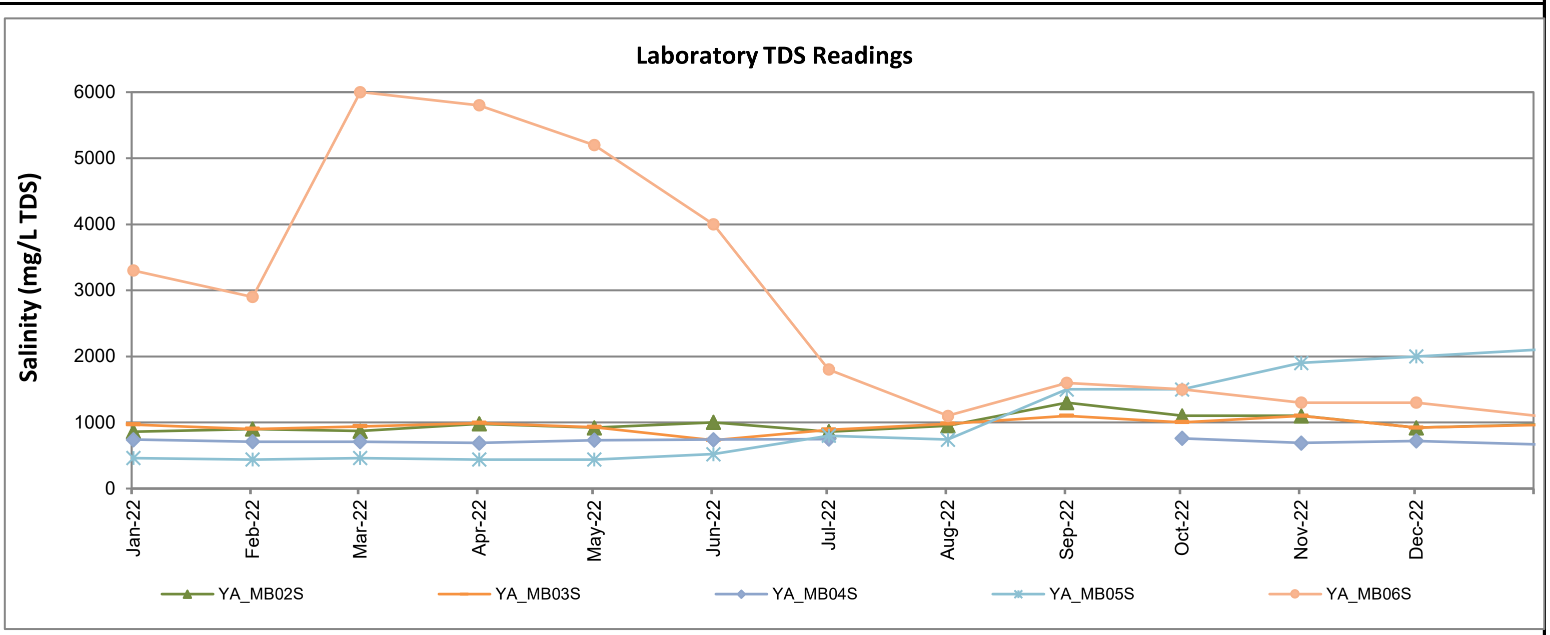
HISTORICAL LABORATORY SALINITY (TDS) DATA (SUPERFICIAL AQUIFER) FIGURE 18

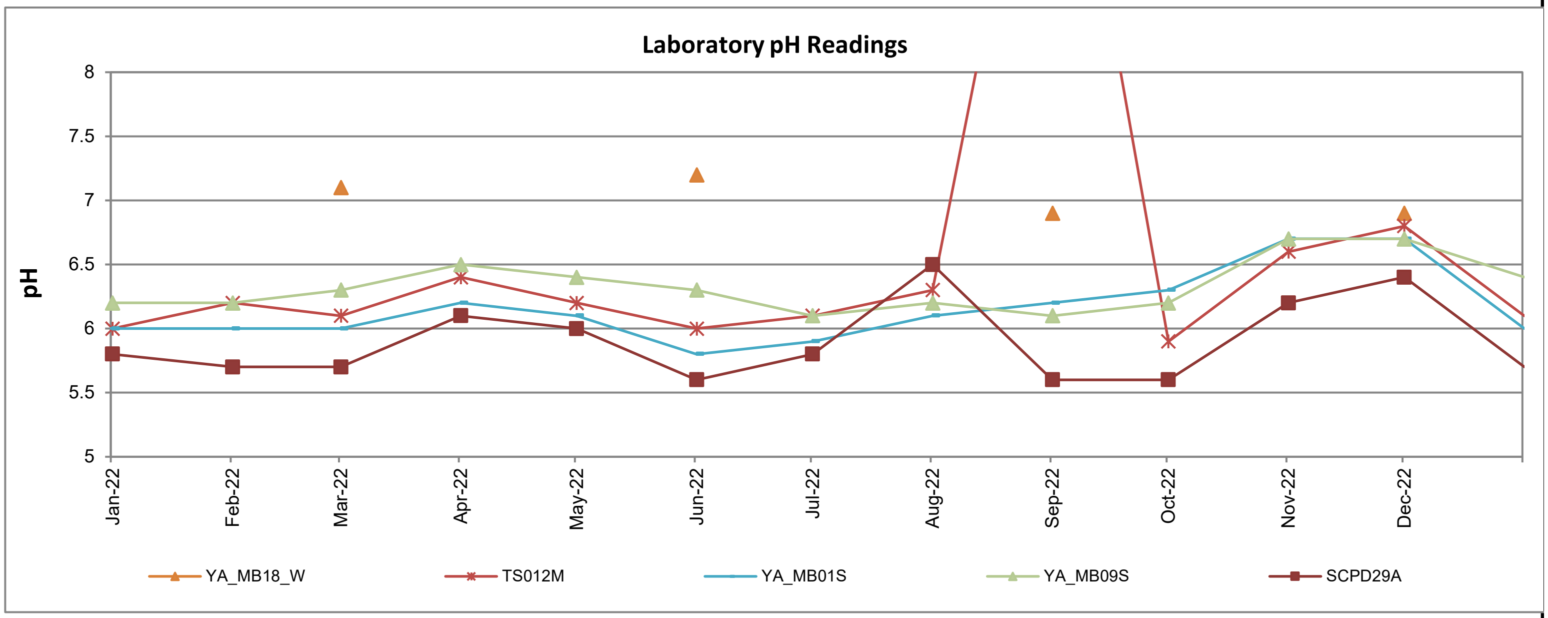


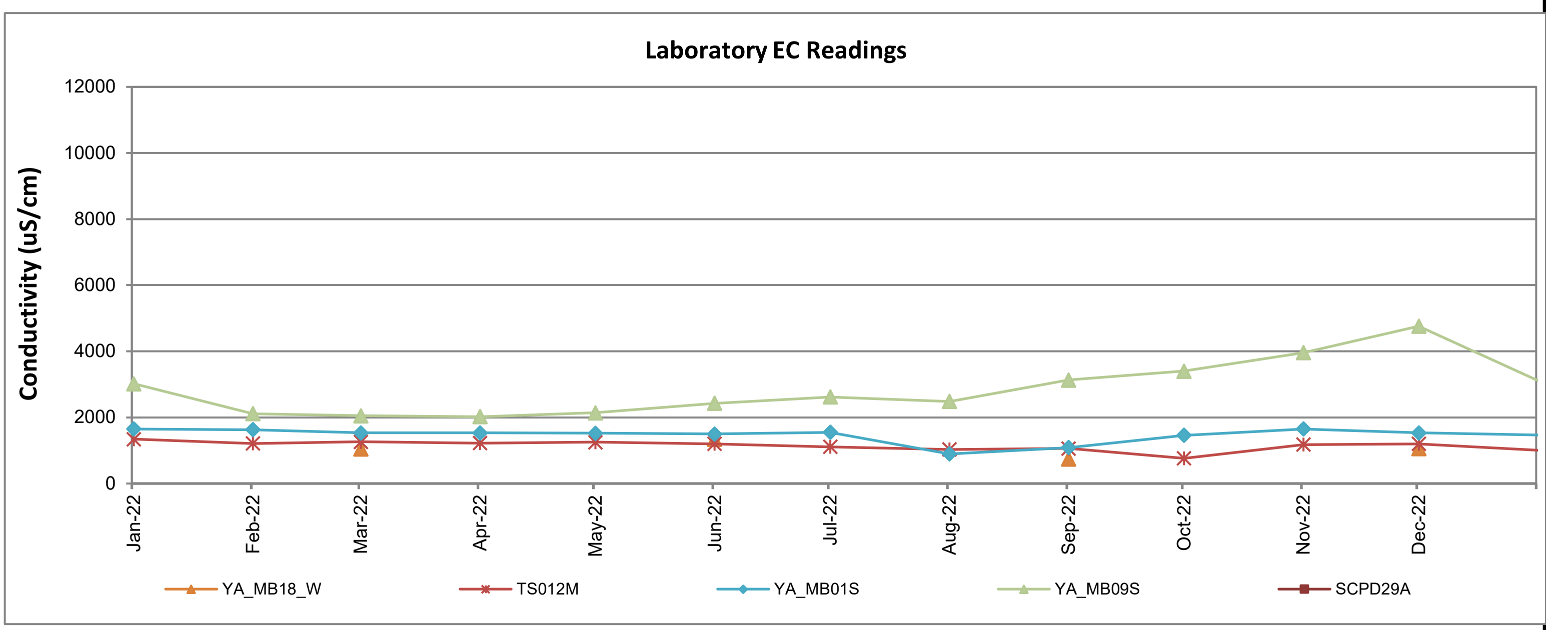


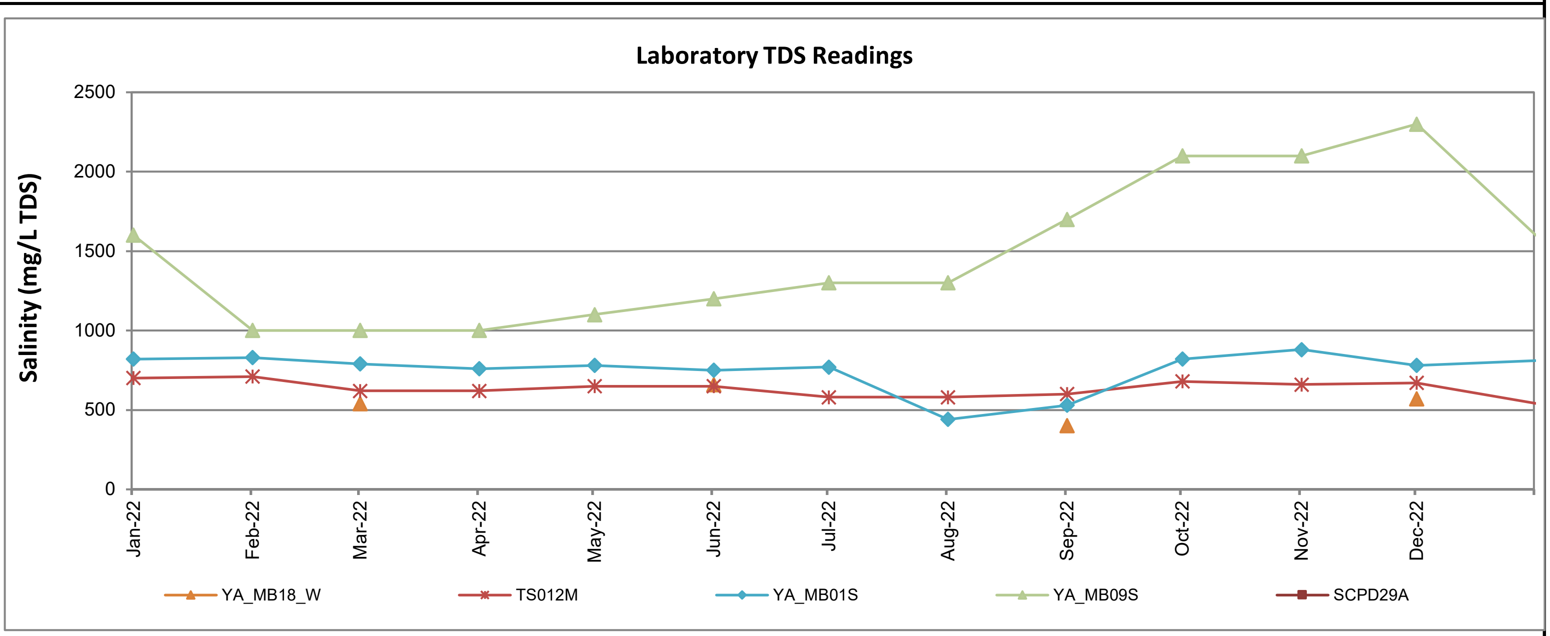


AQ2

LABORATORY CHEMISTRY (pH, EC, TDS) YAMB02S, YAMB03S, YAMB04S, YAMB05S AND YAMB06S, JANUARY TO DECEMBER 2022 FIGURE19a

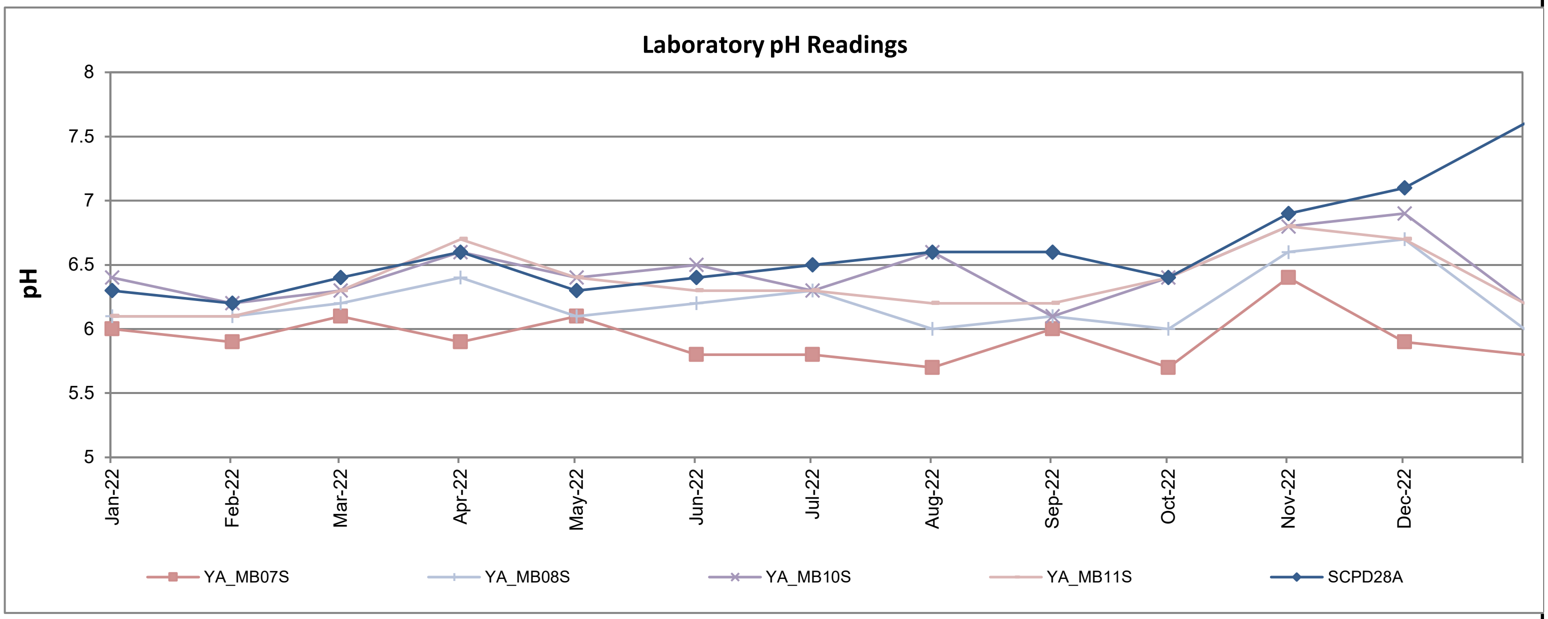


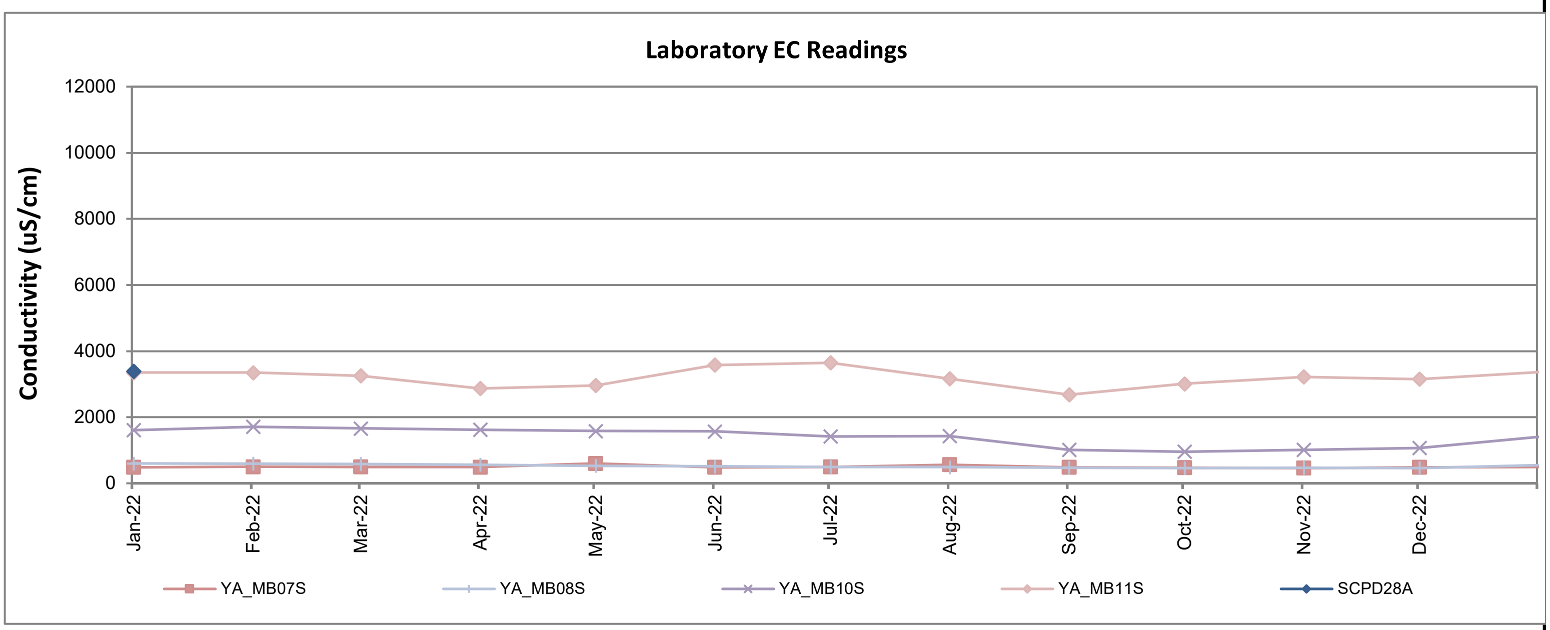


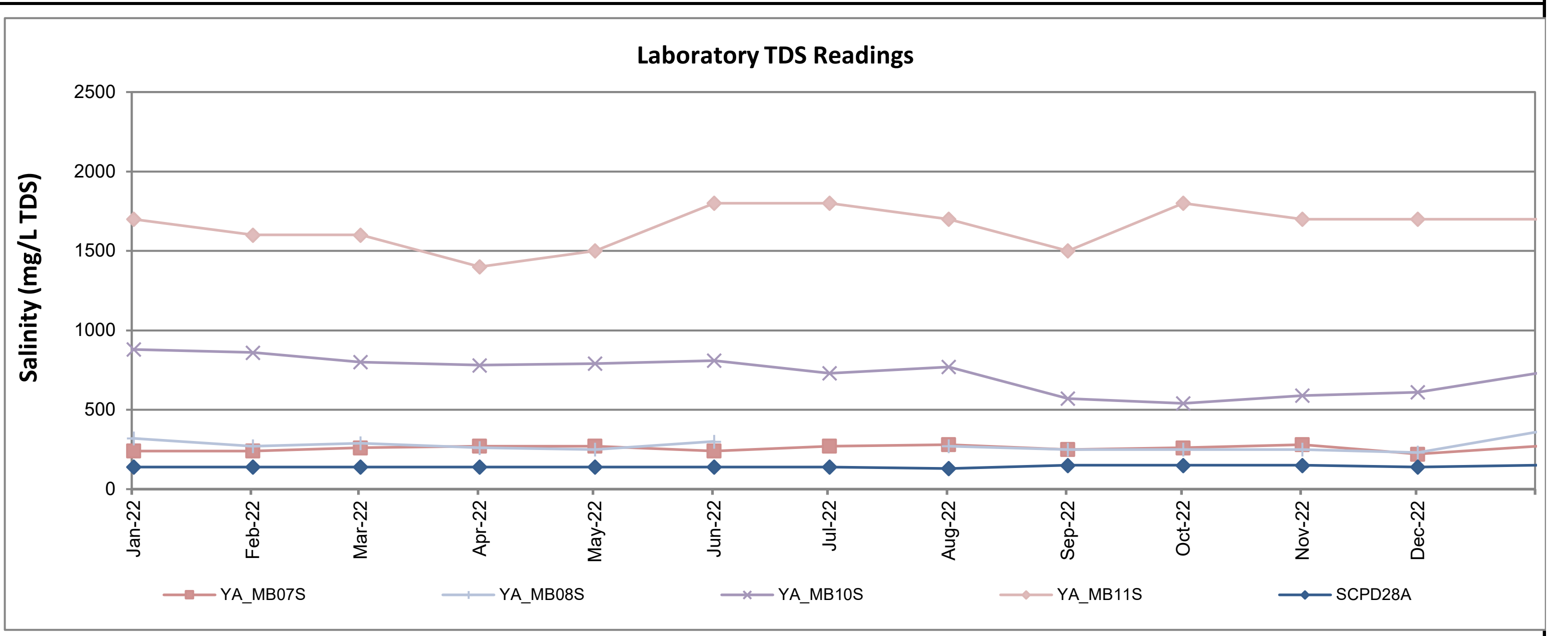


AQ2

LABORATORY CHEMISTRY (pH, EC, TDS) YAMB18W, TS01M, YAMB01S, YAMB09S AND SCPD29A, JANUARY TO DECEMBER 2022 FIGURE 19b

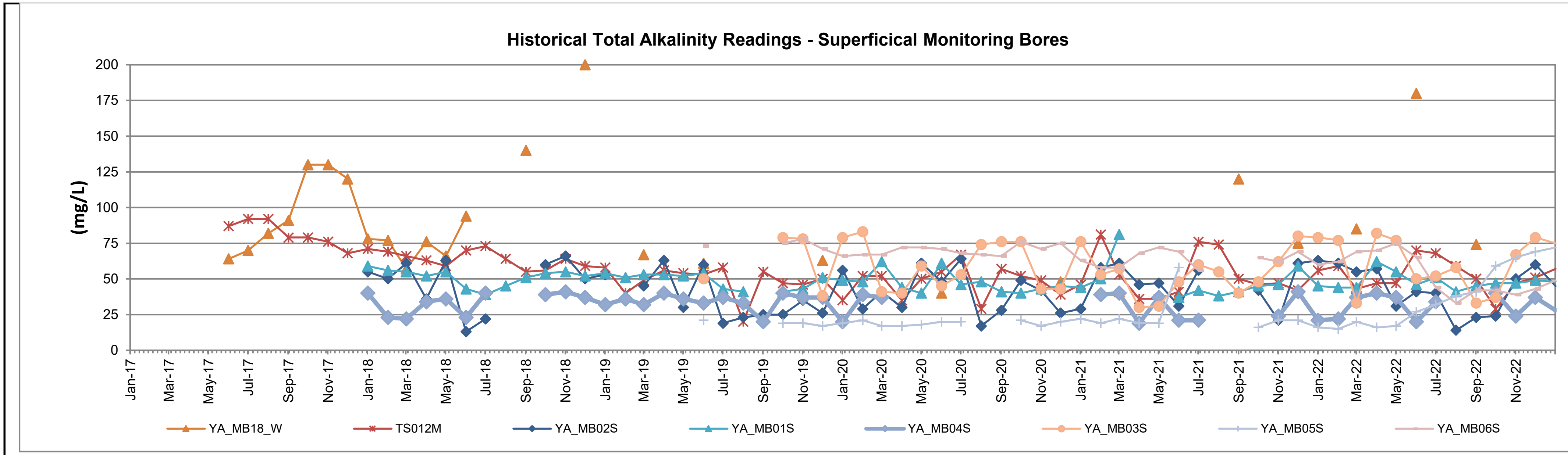


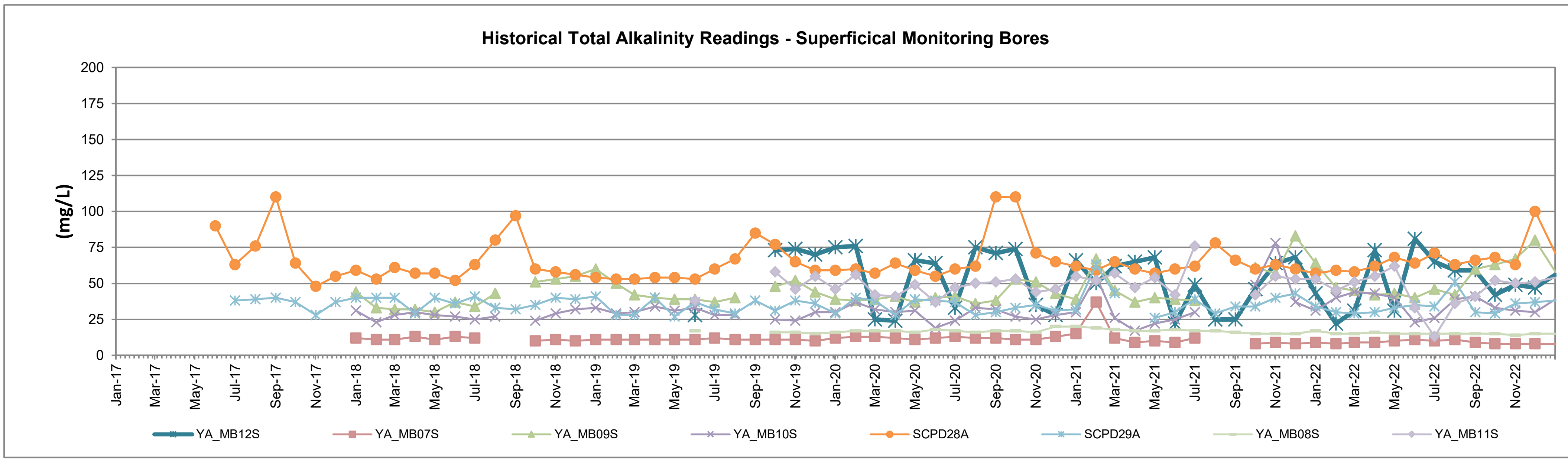




AQ2

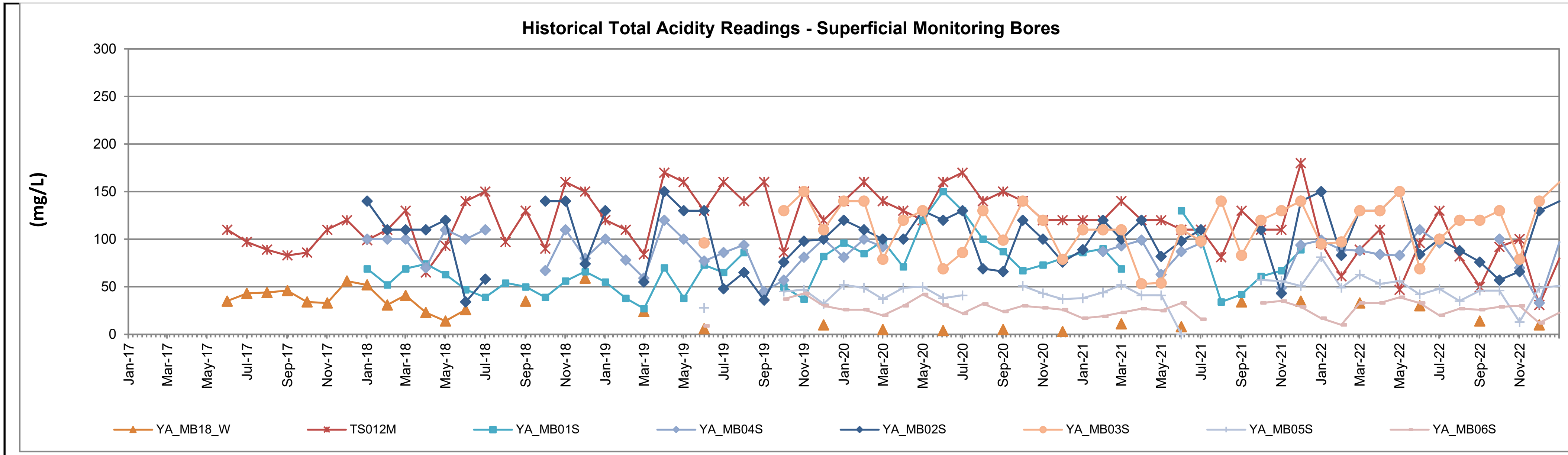
LABORATORY CHEMISTRY (pH, EC, TDS) YAMB07S, YAMB08S, YAMB10S, YAMB11S AND SCPD28A, JANUARY TO DECEMBER 2022 FIGURE 19c

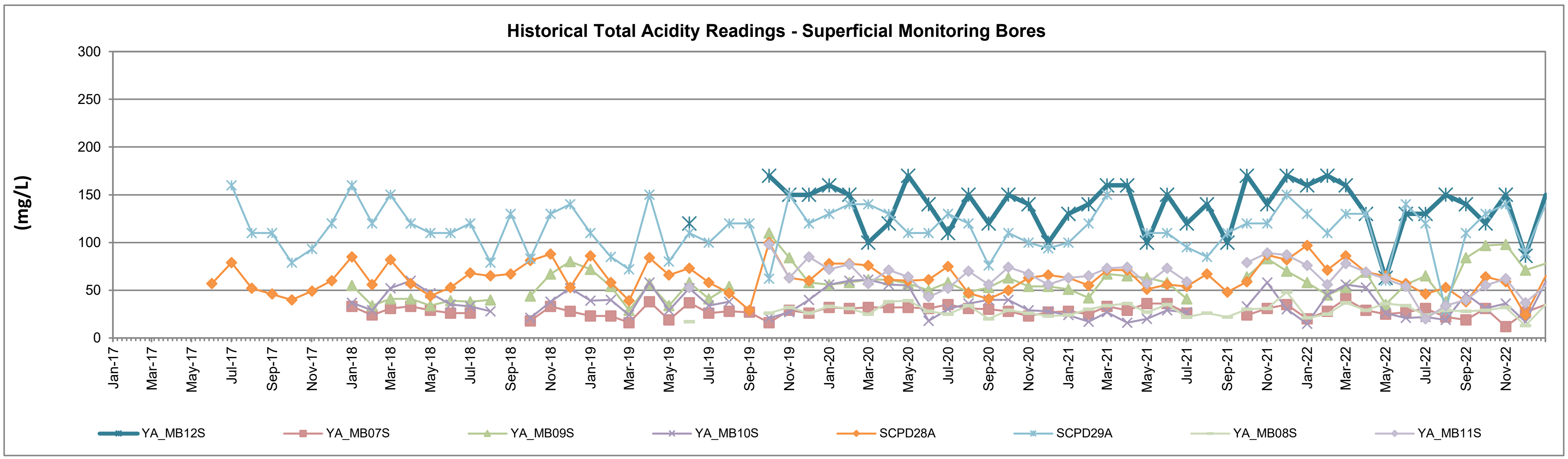




AQ2

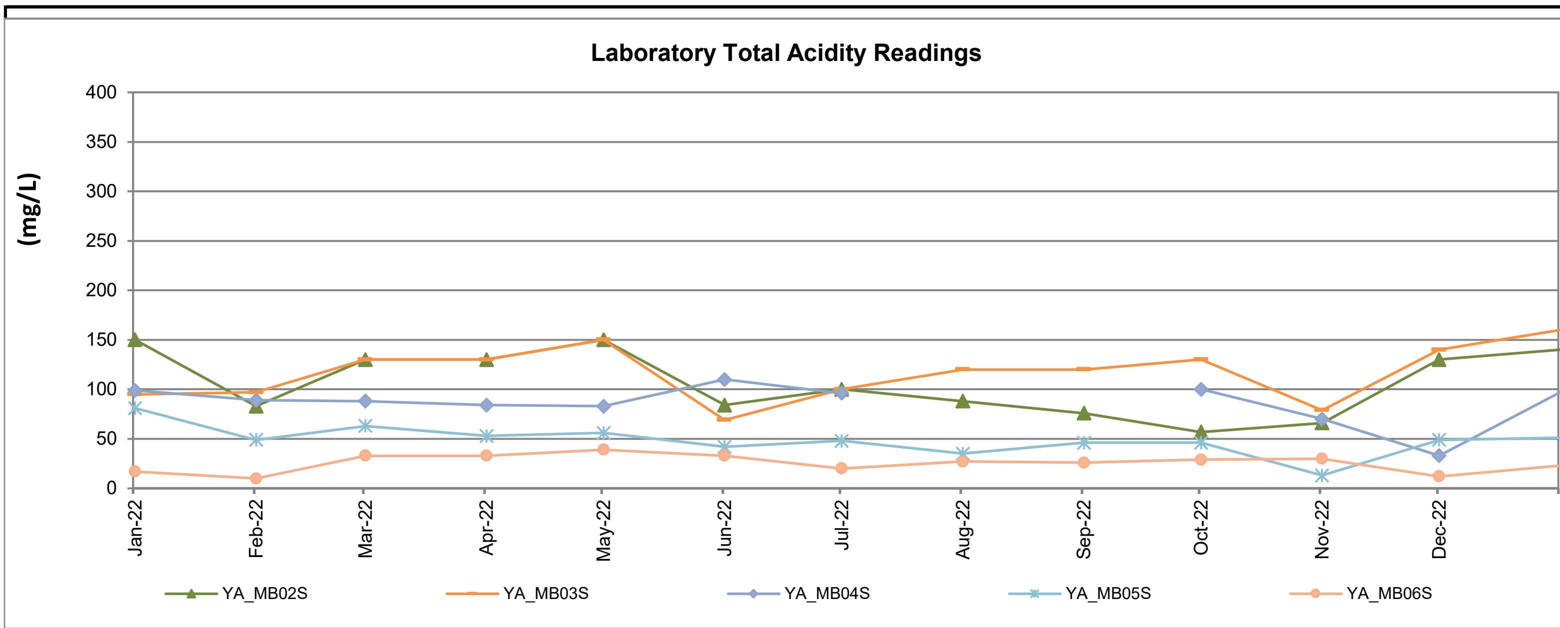
HISTORICAL LABORATORY TOTAL ALKALINITY DATA (SUPERFICIAL AQUIFER) FIGURE 20

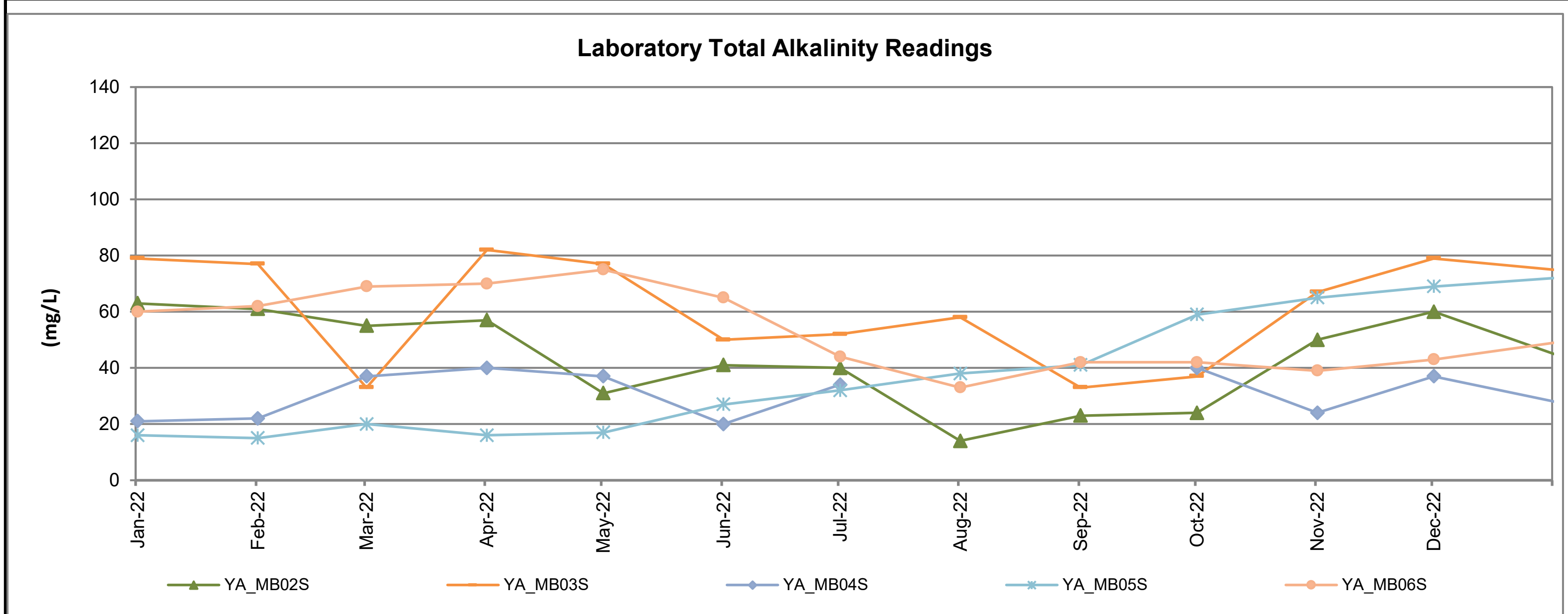


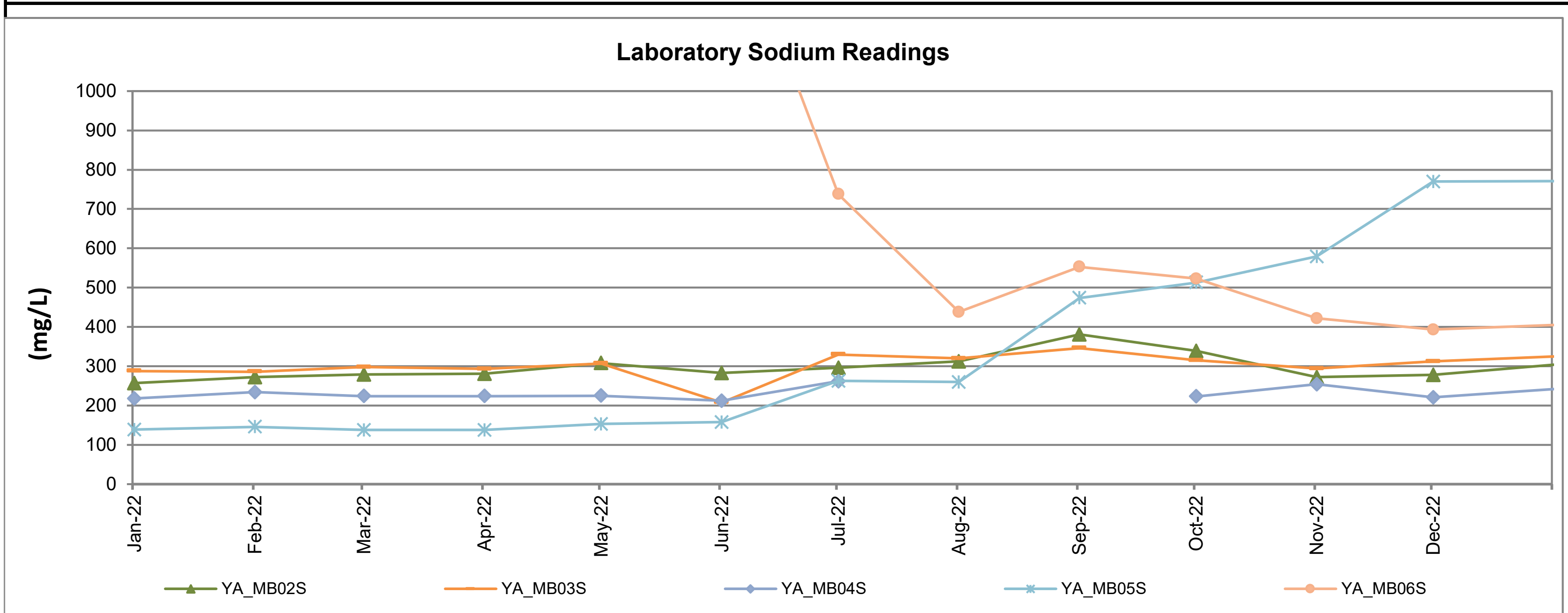


AQ2

HISTORICAL LABORATORY TOTAL ACIDITY DATA (SUPERFICIAL AQUIFER) FIGURE 21

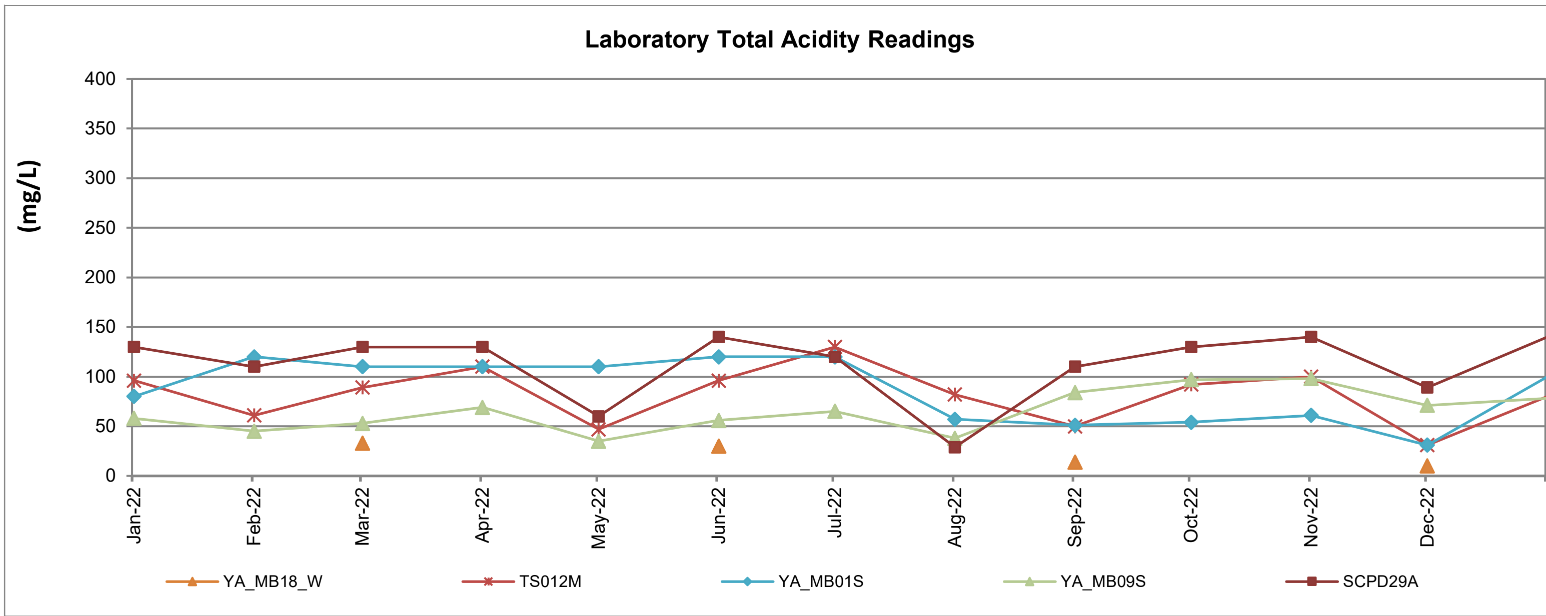


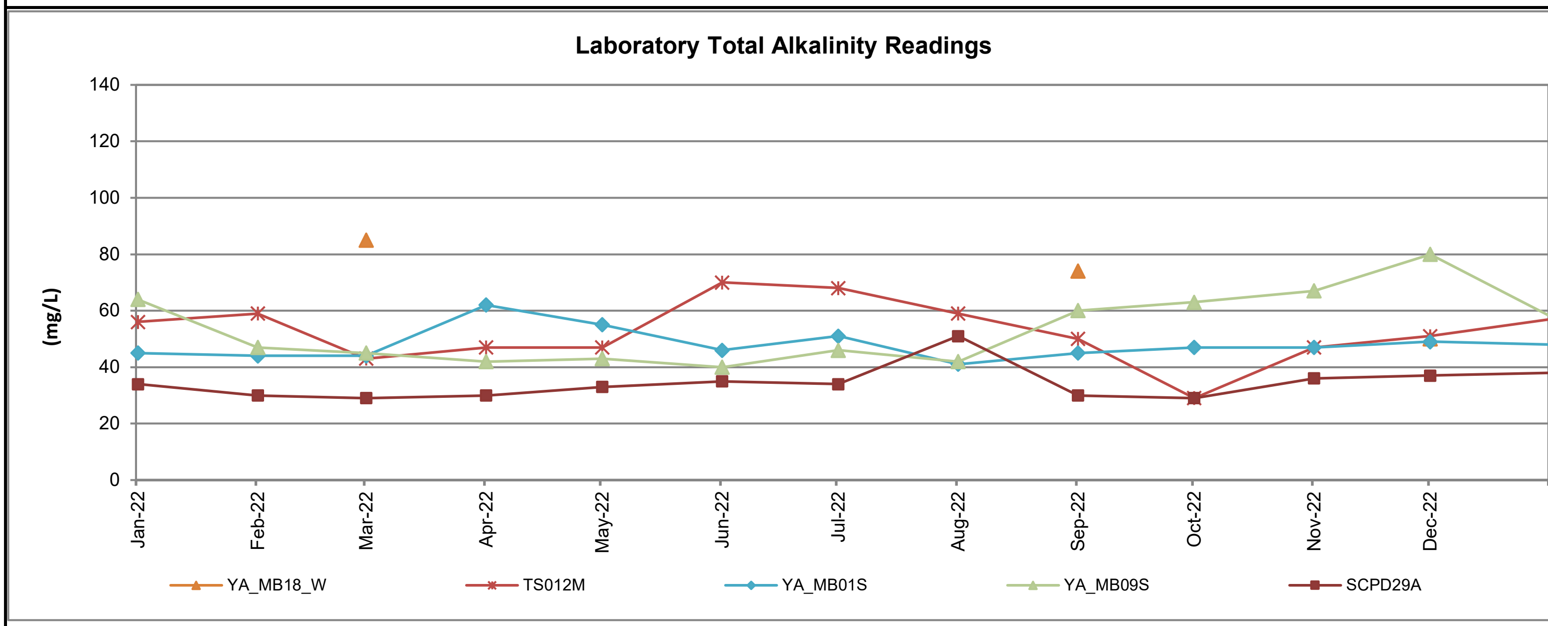


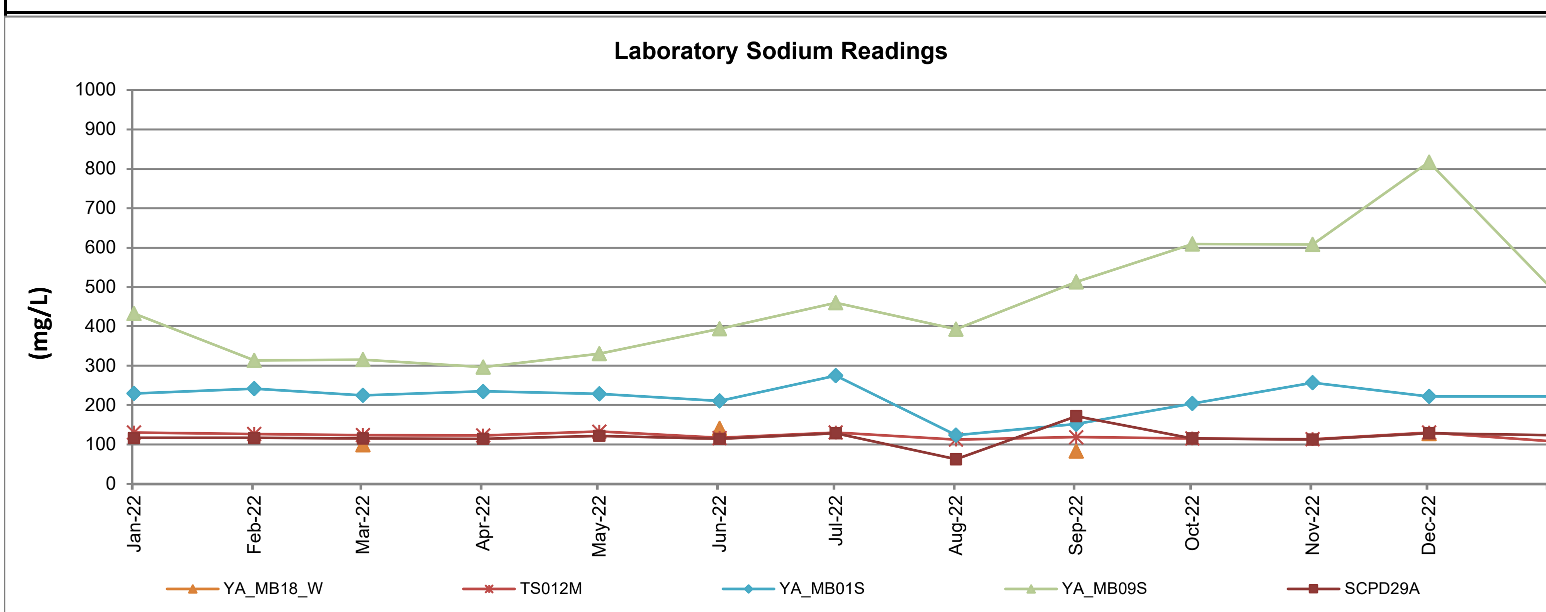


AQ2

LABORATORY CHEMISTRY (TOTAL ALKALINITY, TOTAL ACIDITY, SODIUM) YAMB02S, YAMB03S, YAMB04S, YAMB05S AND YAMB06S, JANUARY TO DECEMBER 2022 FIGURE 22a

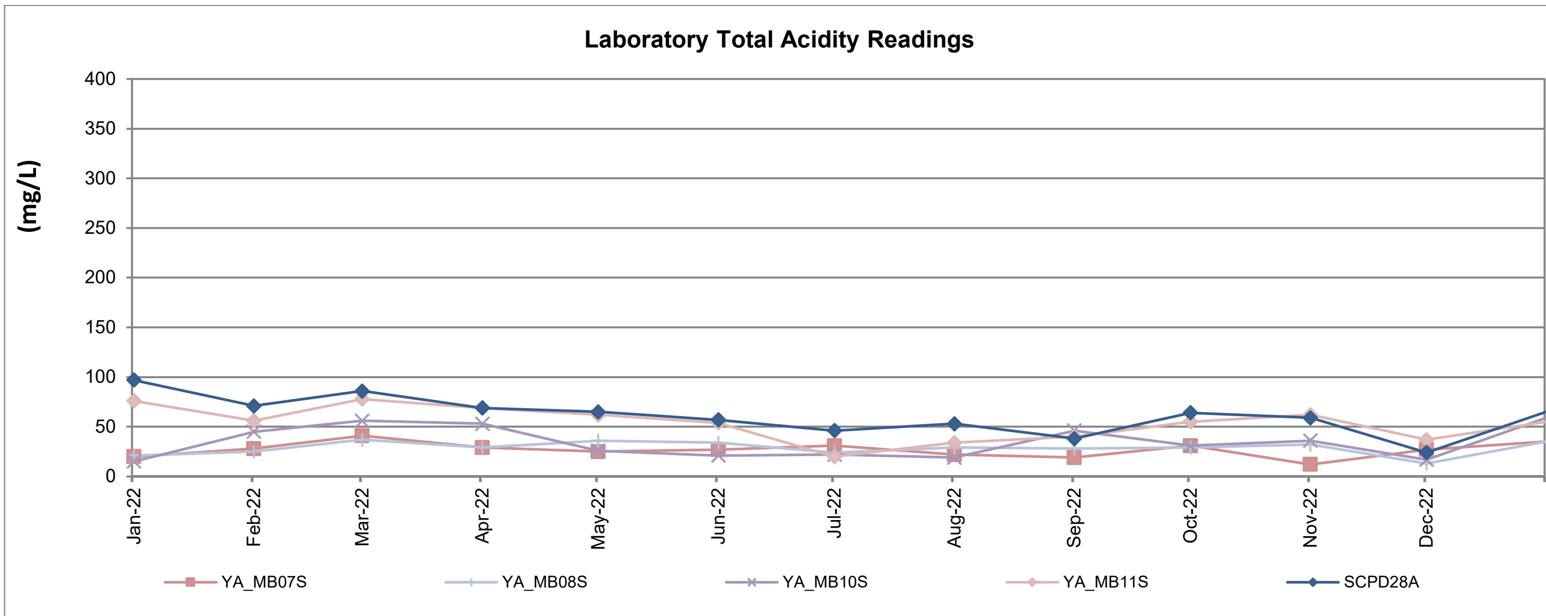


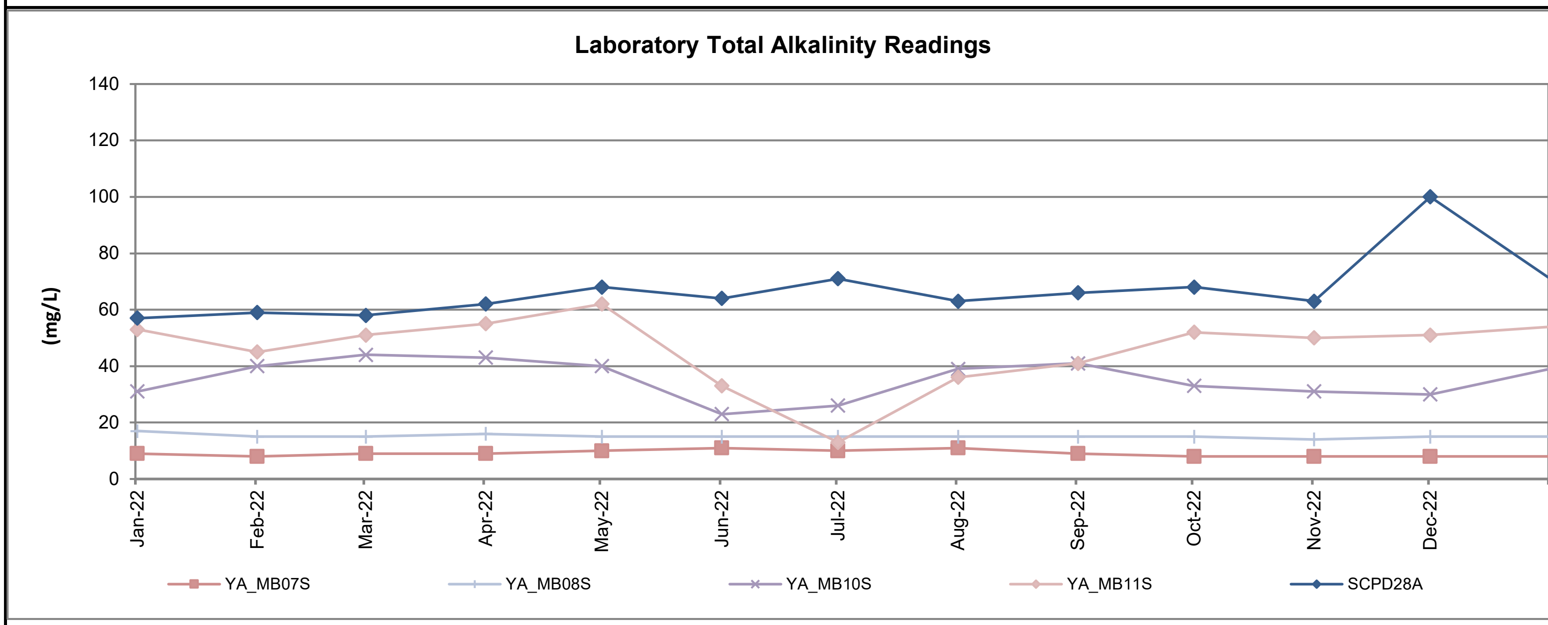


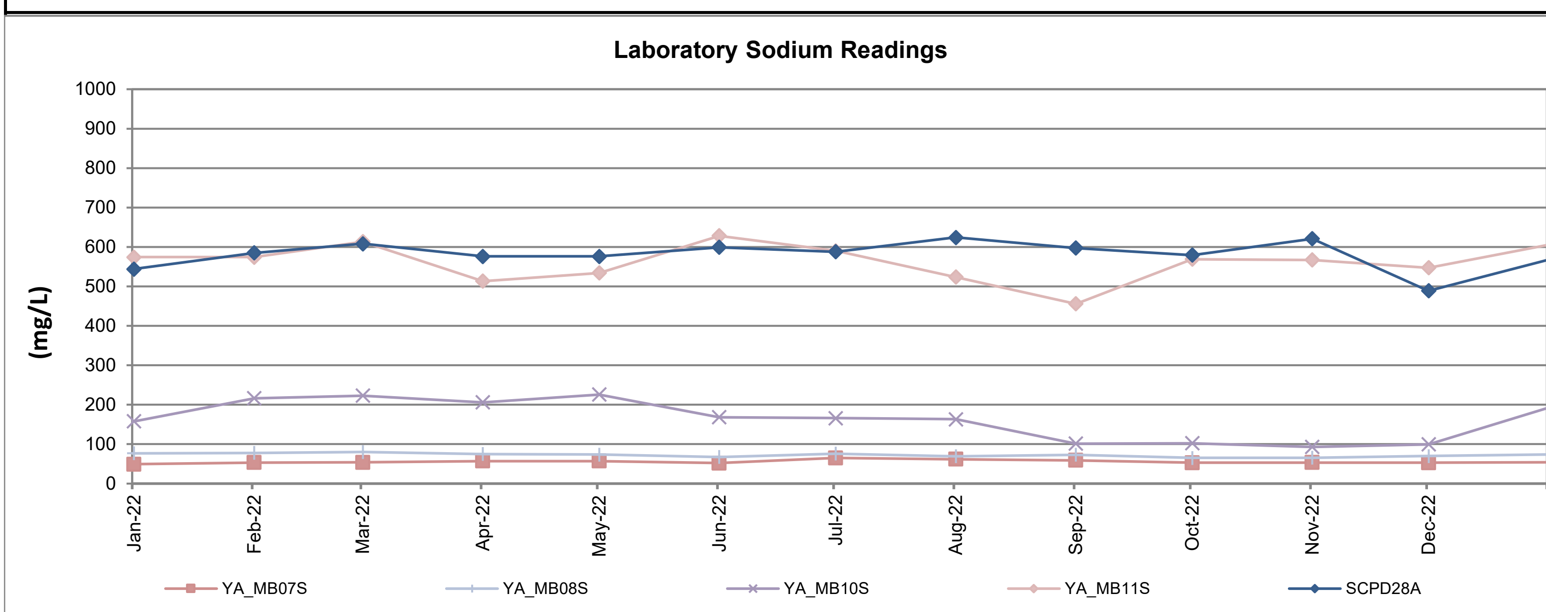


AQ2

LABORATORY CHEMISTRY (SODIUM, TOTAL ACIDITY, TOTAL ALKALINITY) YAMB18W, TS01M, YAMB01S, YAMB09S AND SCPD29A, JANUARY TO DECEMBER 2022 FIGURE 22b

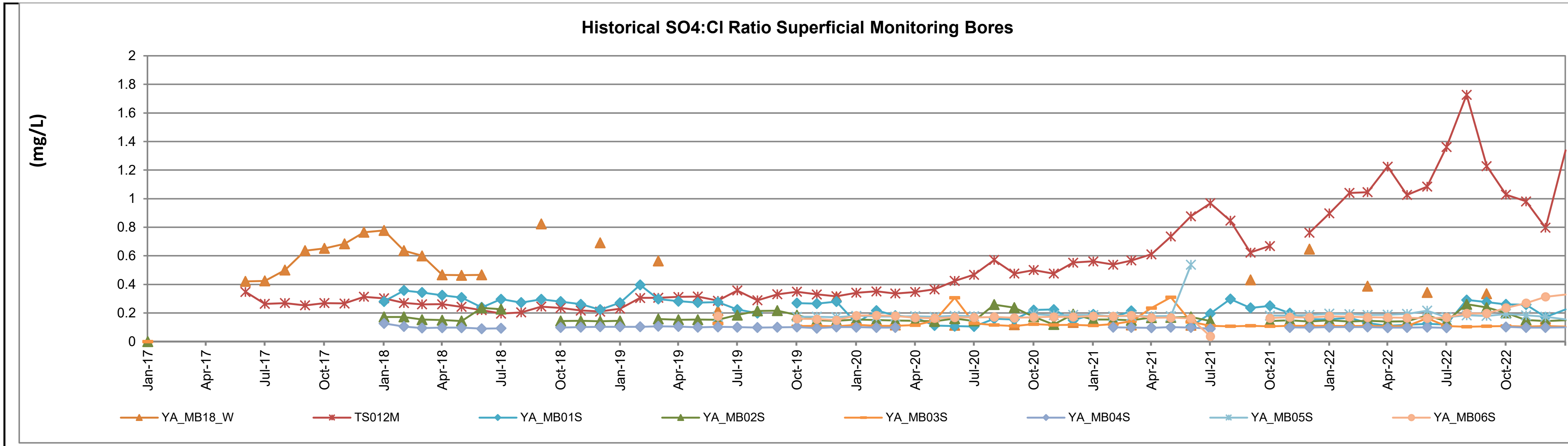


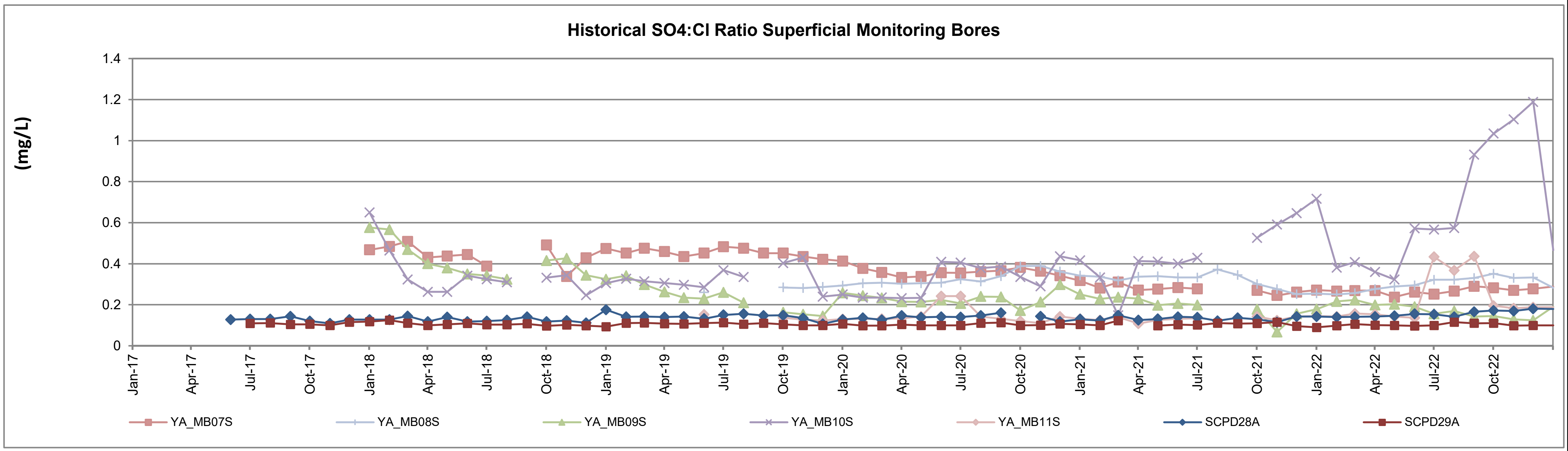




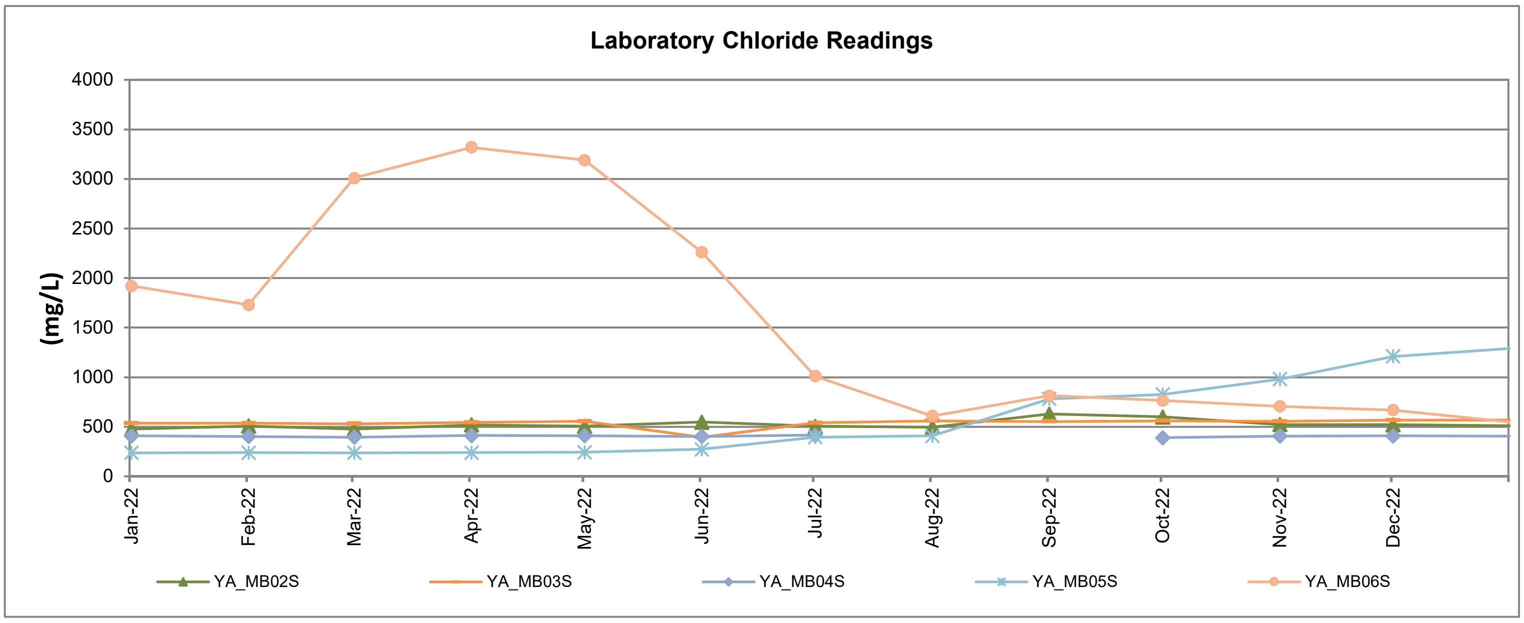
AQ2

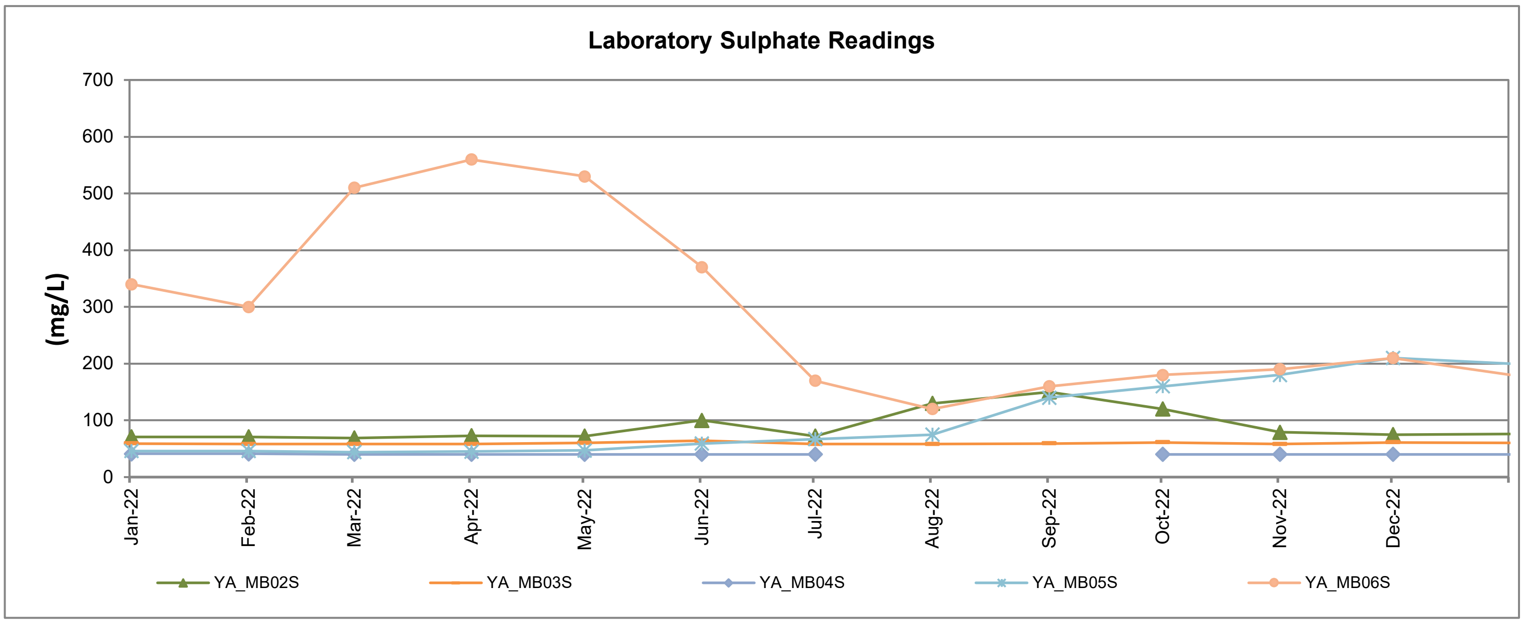
LABORATORY CHEMISTRY (SODIUM, TOTAL ACIDITY, TOTAL ALKALINITY) YAMB07S, YAMB08S, YAMB10S, YAMB11S AND SCPD28A,, JANUARY TO DECEMBER 2022 FIGURE 22c

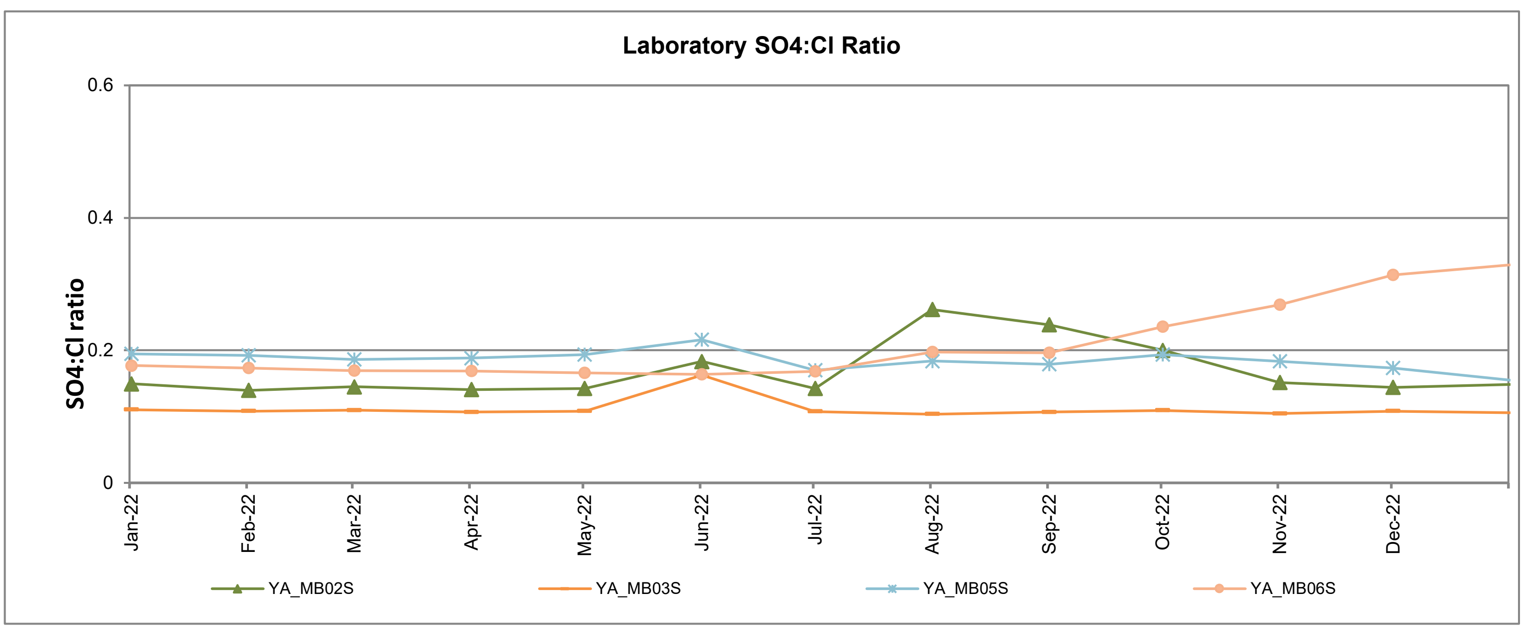




HISTORICAL LABORATORY SULPHATE CHLORIDE RATIO DATA (SUPERFICIAL AQUIFER) FIGURE 29

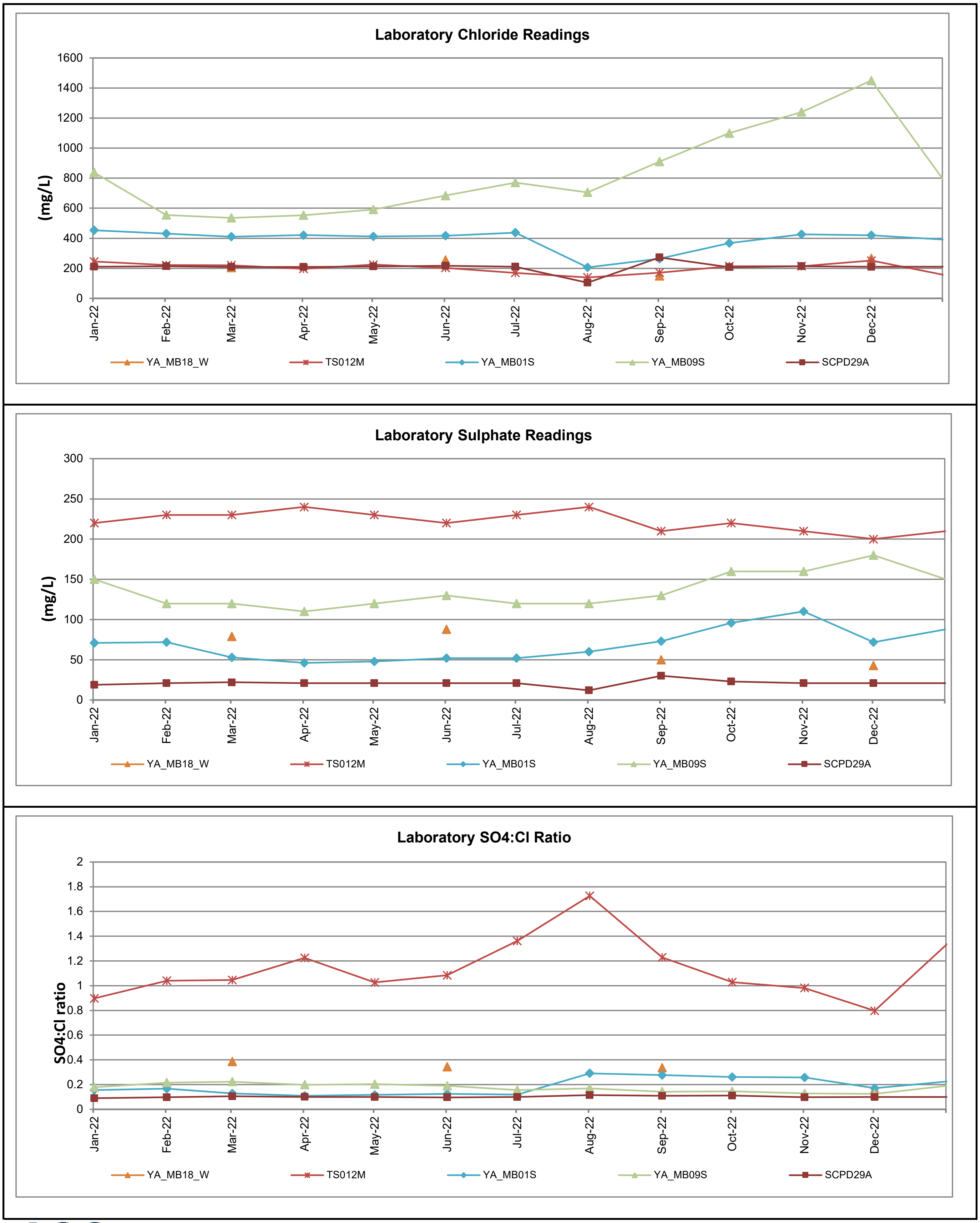






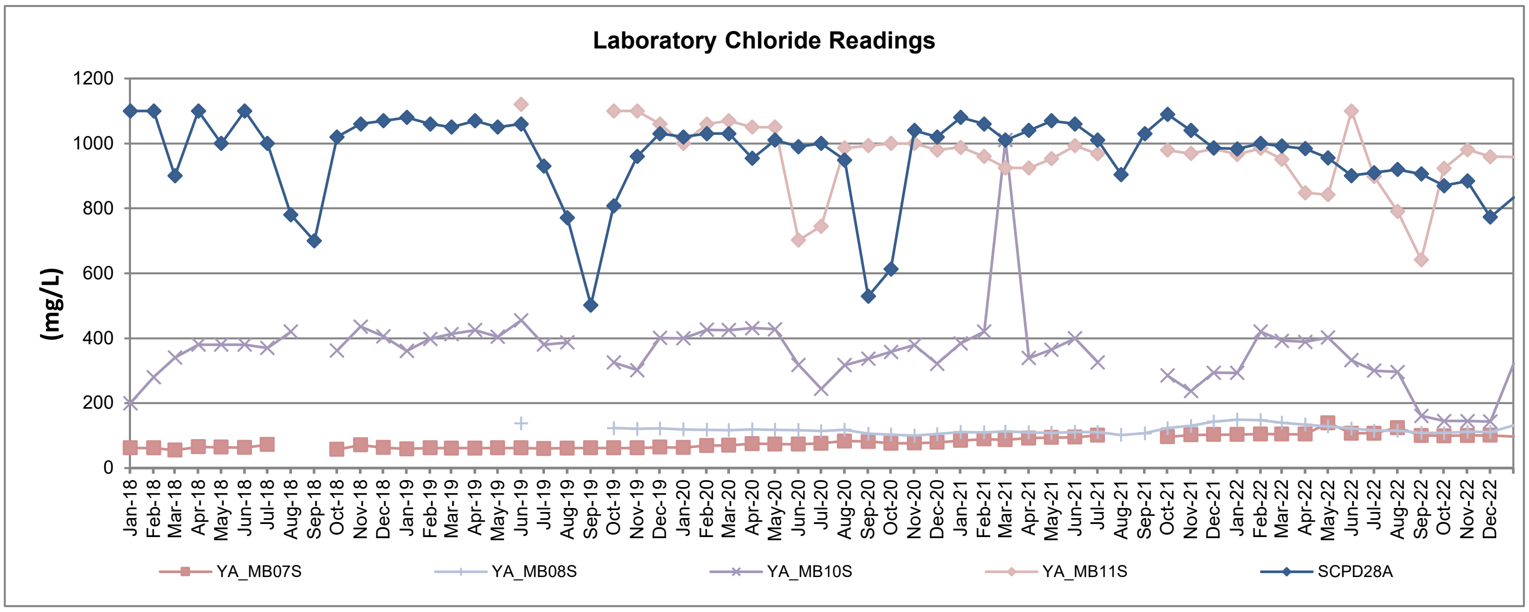
AQ2

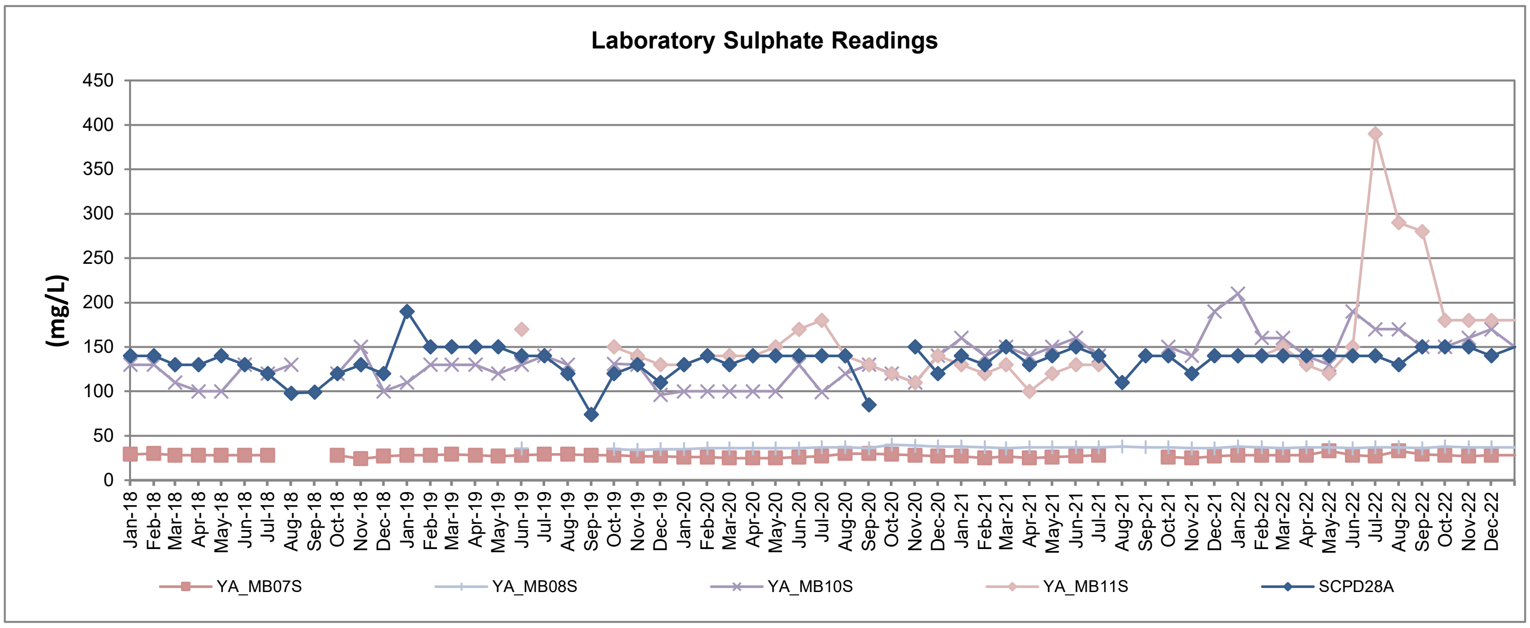
LABORATORY CHEMISTRY (CHLORIDE, SULPHATE, SULPHATE:CHLORIDE RATIO) YAMB02S, YAMB03S, YAMB04S, YAMB05S AND YAMB06S, JANUARY TO DECEMBER 2022 FIGURE 24a

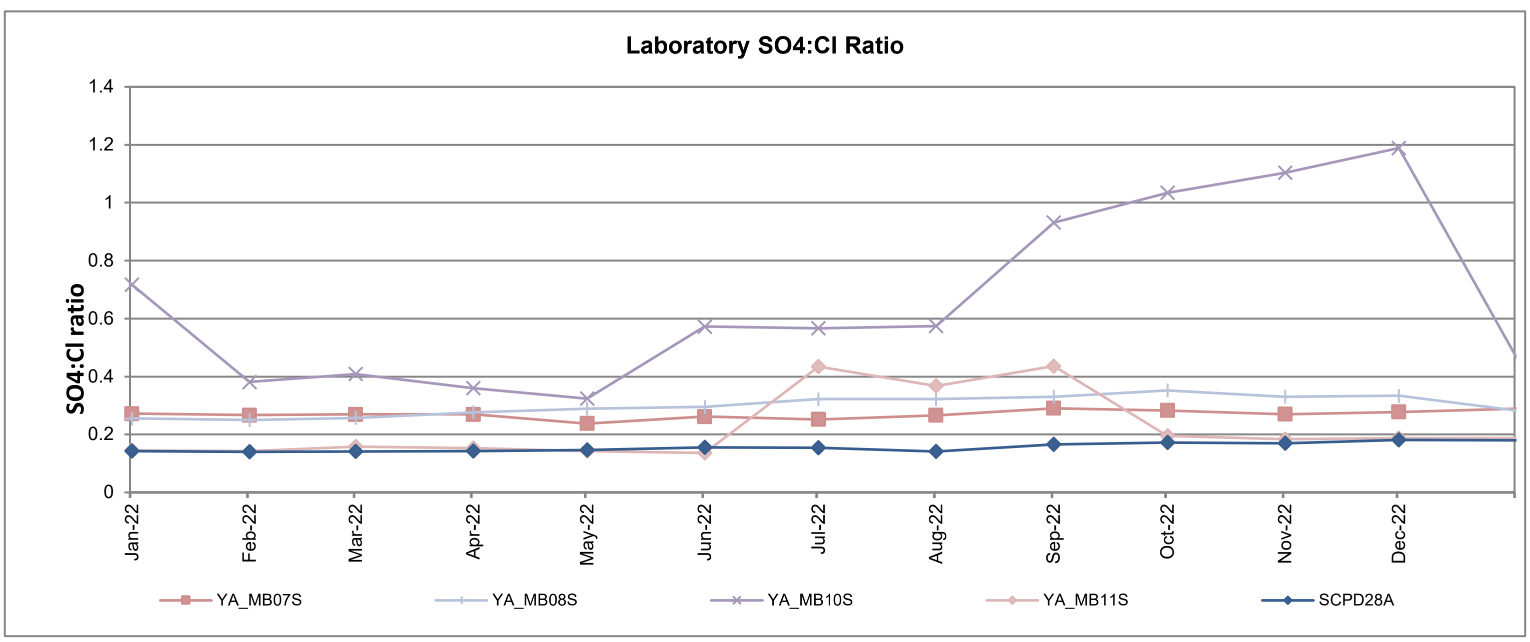


AQ2

LABORATORY CHEMISTRY (CHLORIDE, SULPHATE, SULPHATE:CHLORIDE RATIO) YAMB18W, TS01M, YAMB01S, YAMB09S AND SCPD29A, JANUARY TO DECEMBER 2022 FIGURE 24b

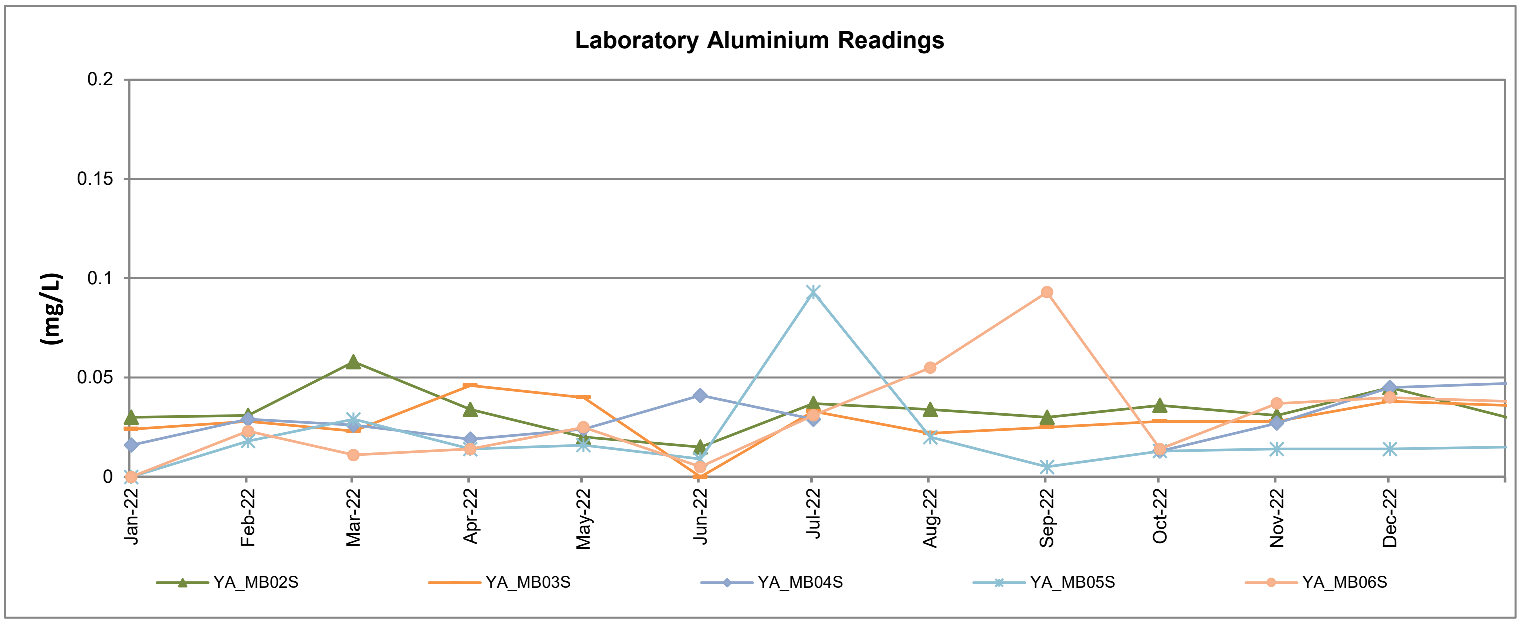


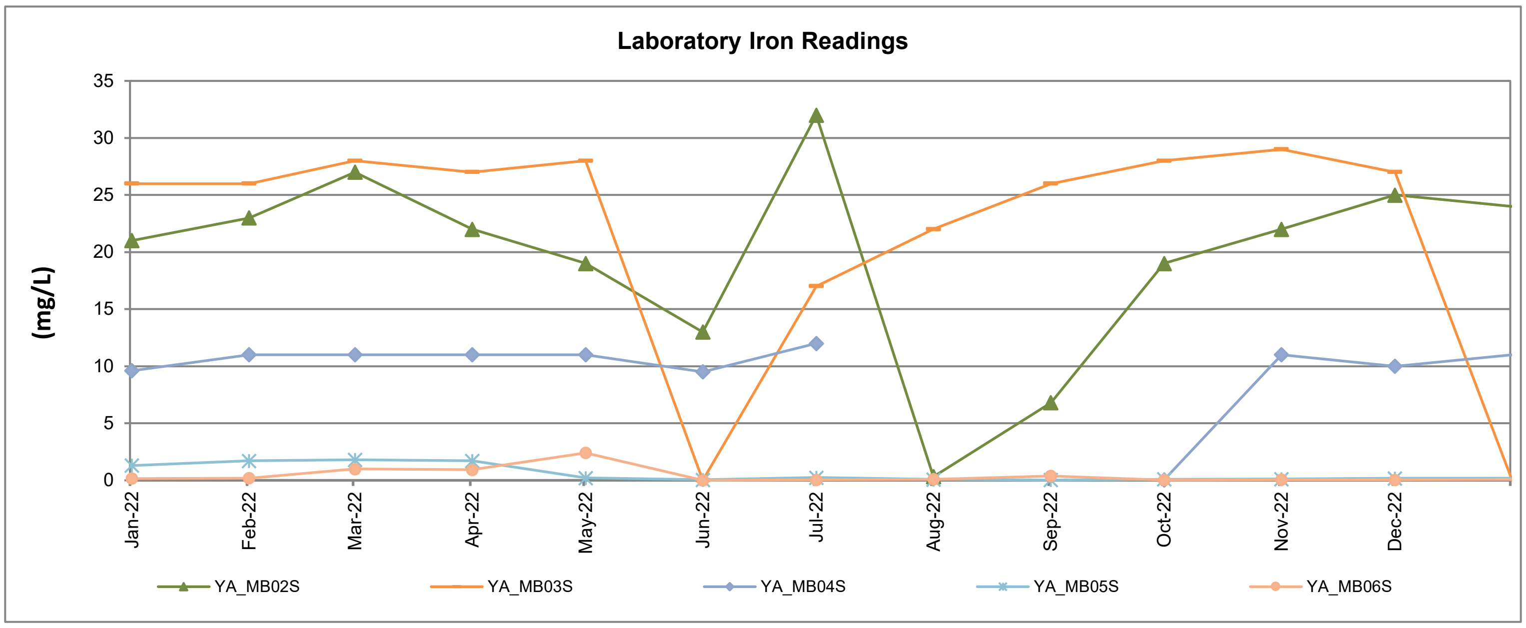


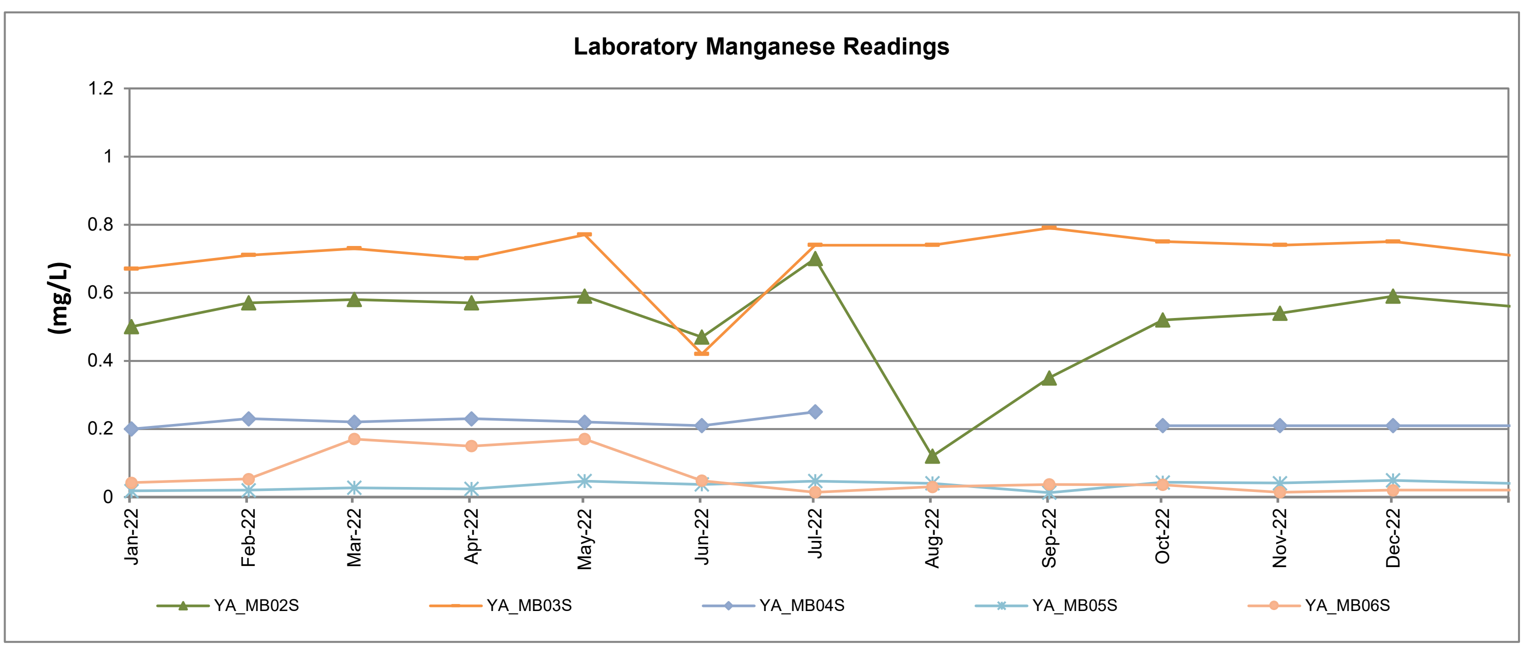


AQ2

LABORATORY CHEMISTRY (CHLORIDE, SULPHATE, SULPHATE:CHLORIDE RATIO) YAMB07S, YAMB08S, YAMB10S, YAMB11S AND SCPD28A,S, JANUARY TO DECEMBER 2022 FIGURE 24c

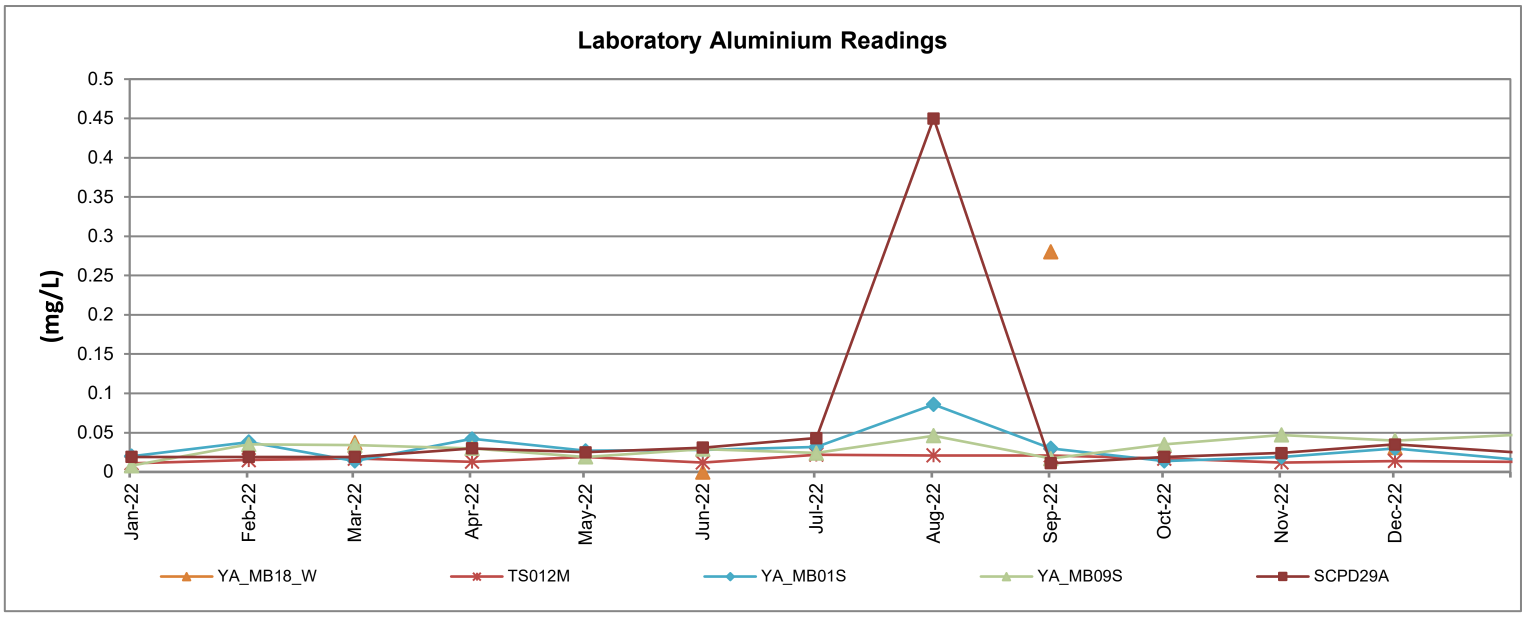


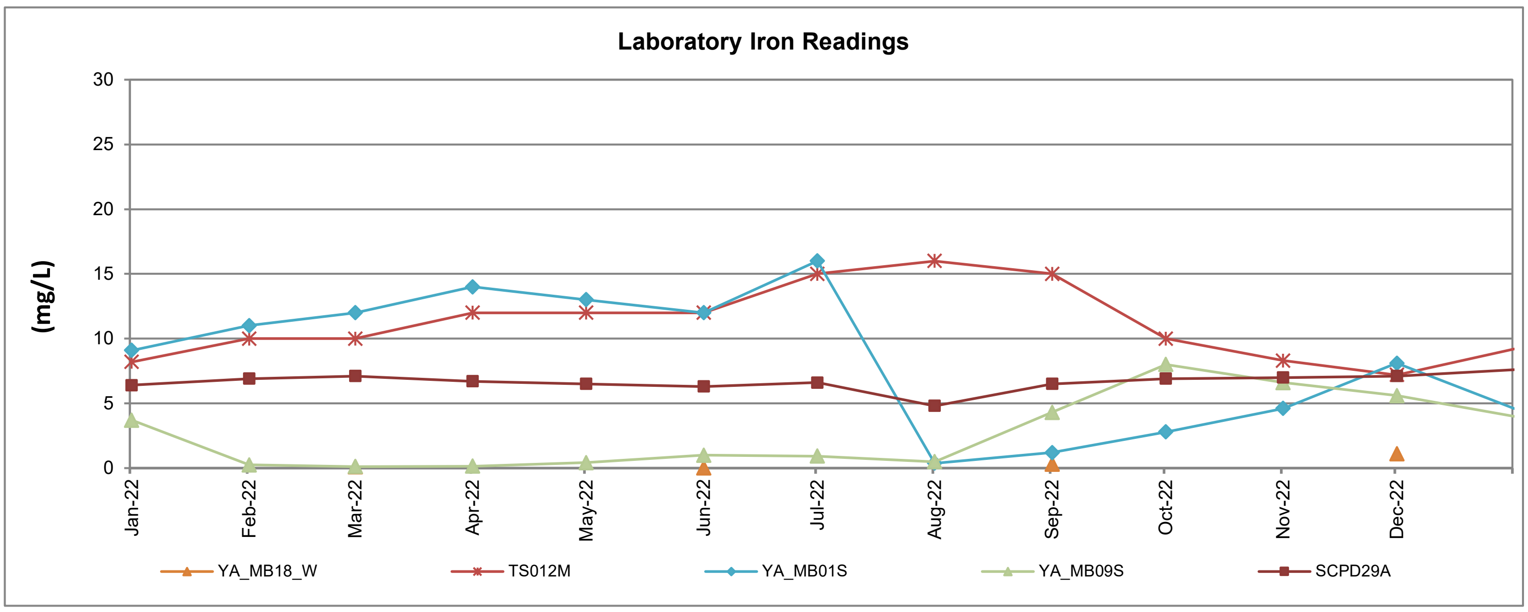


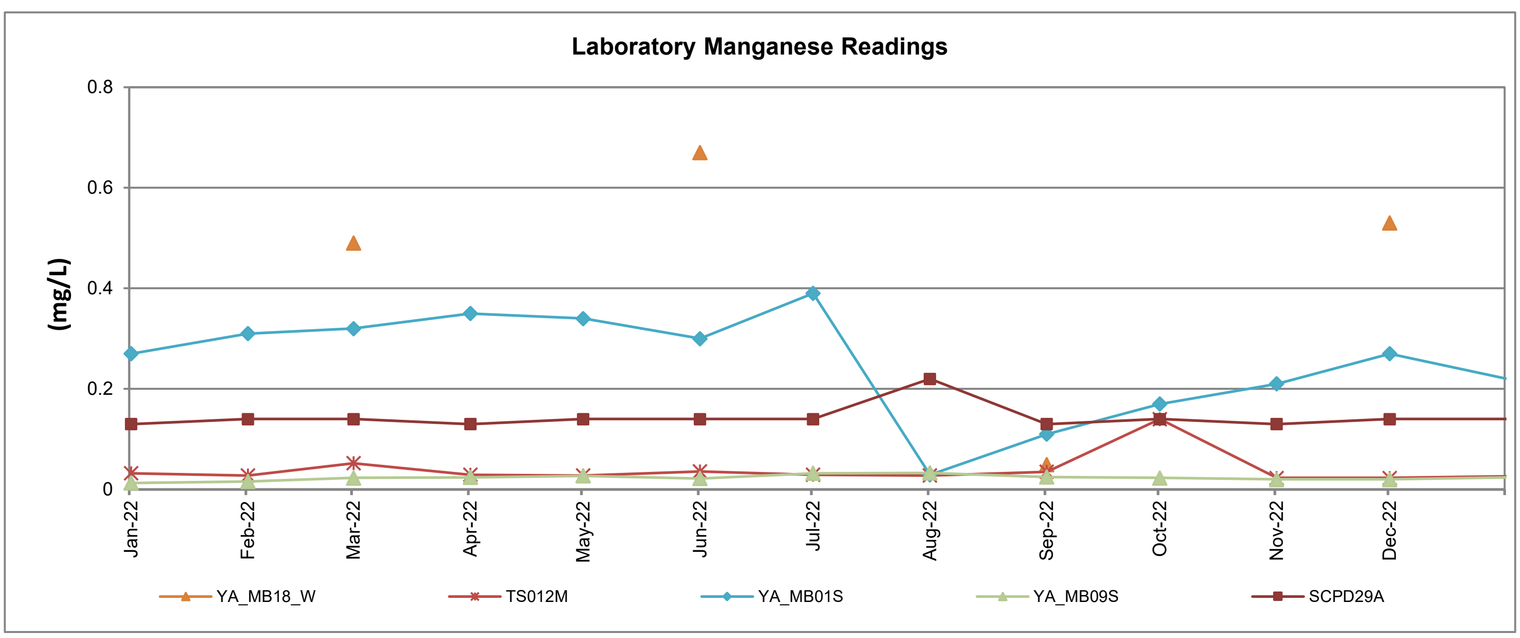


AQ2

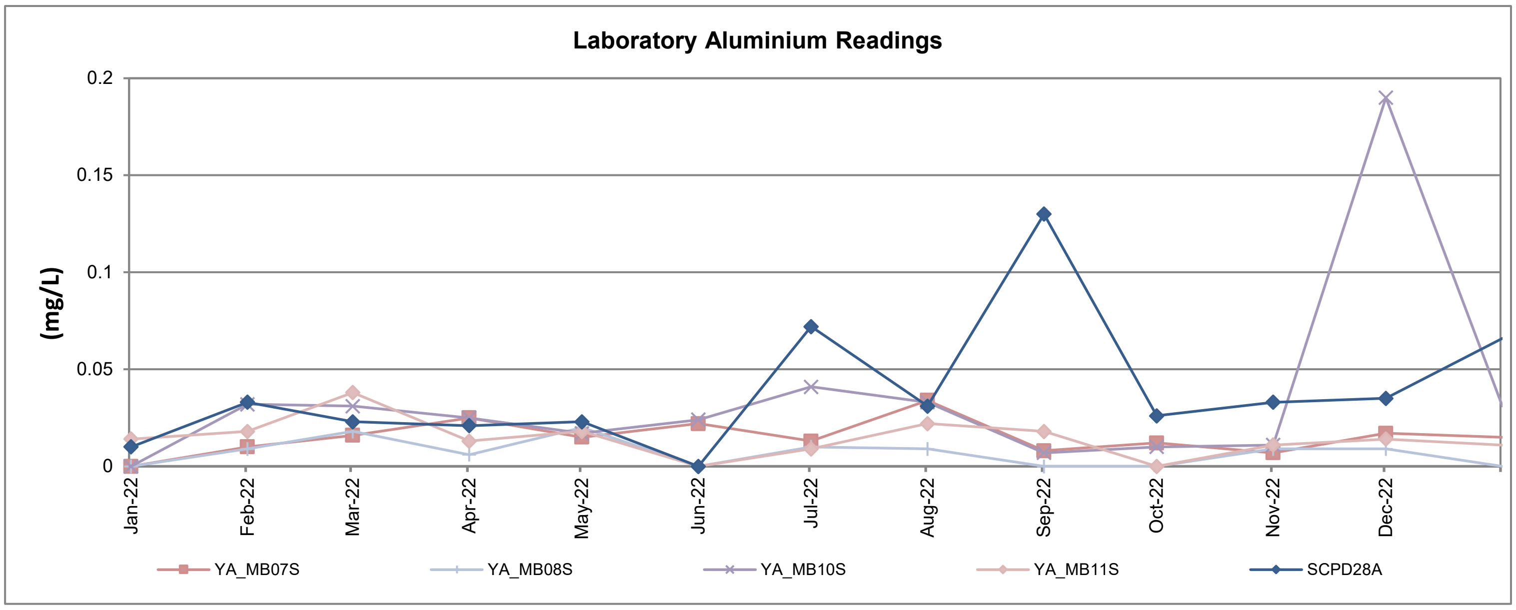
LABORATORY CHEMISTRY (ALUMINIUM, IRON, MANGANESE) YAMB02S, YAMB03S, YAMB04S, YAMB05S AND YAMB06S, JANUARY TO DECEMBER 2022 FIGURE 25a

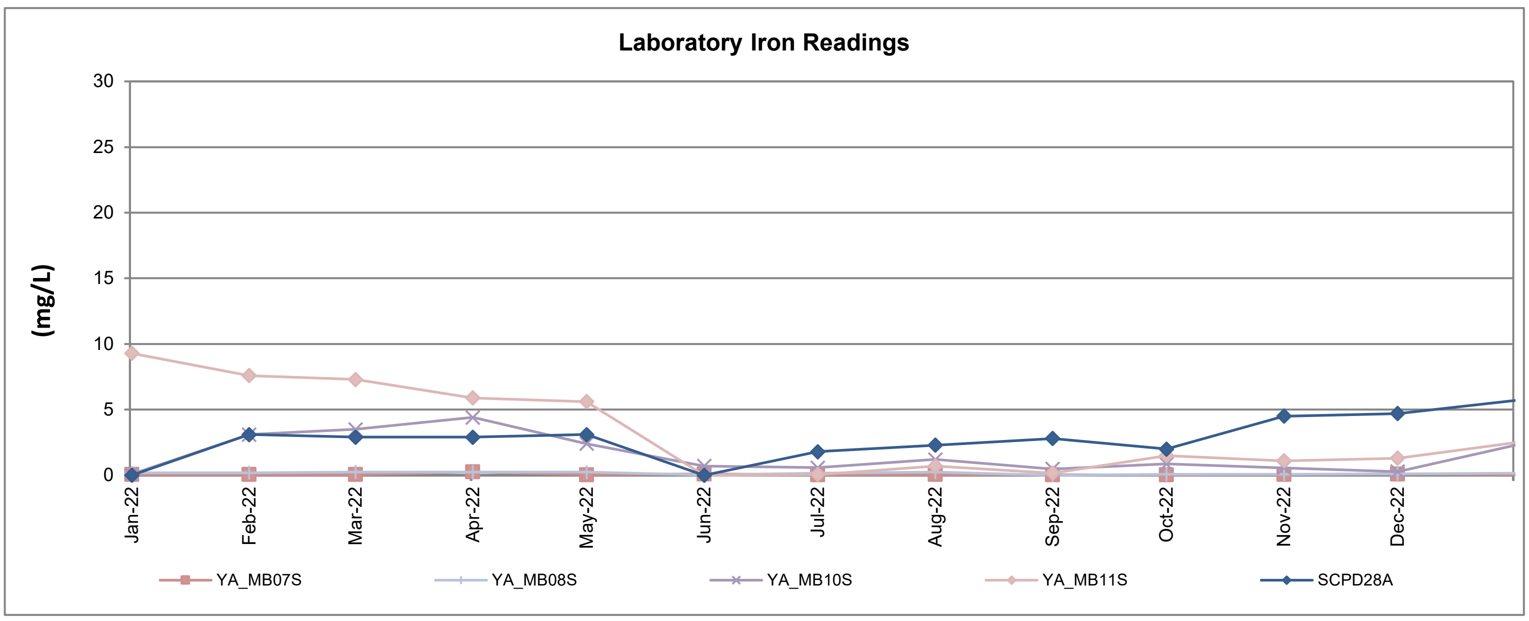


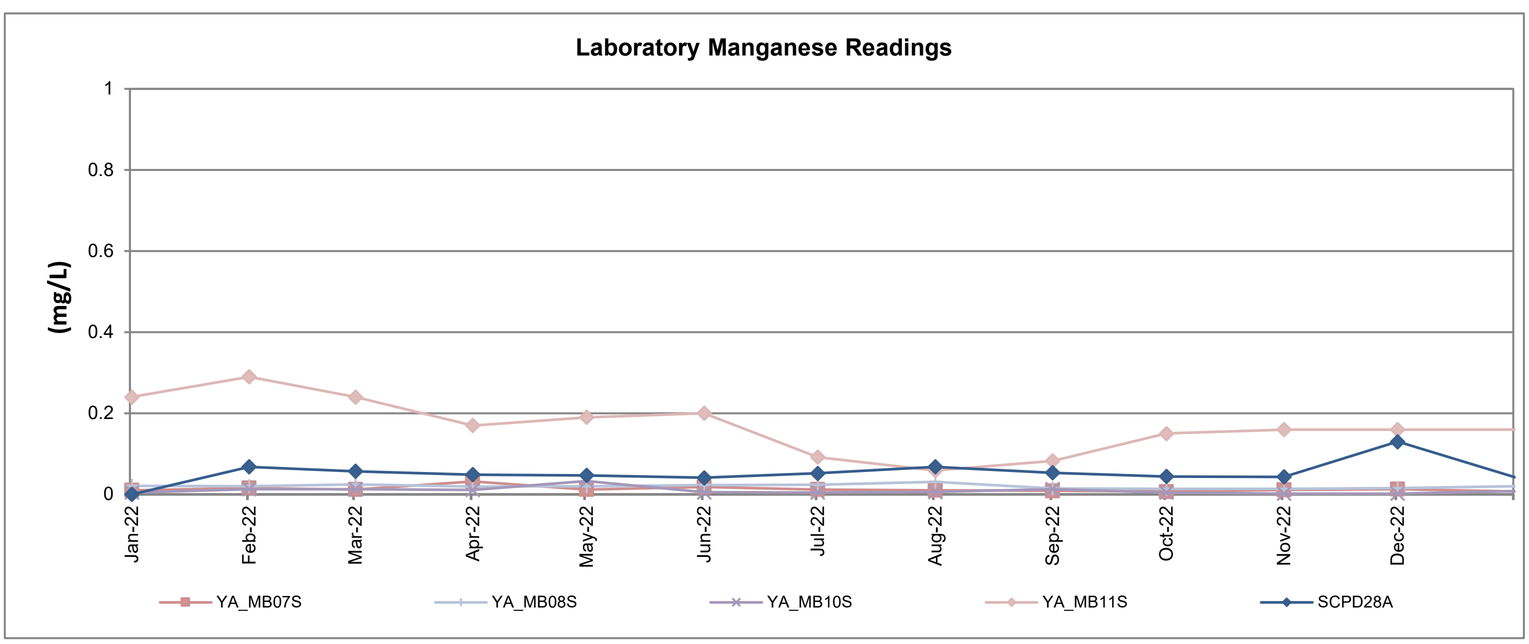




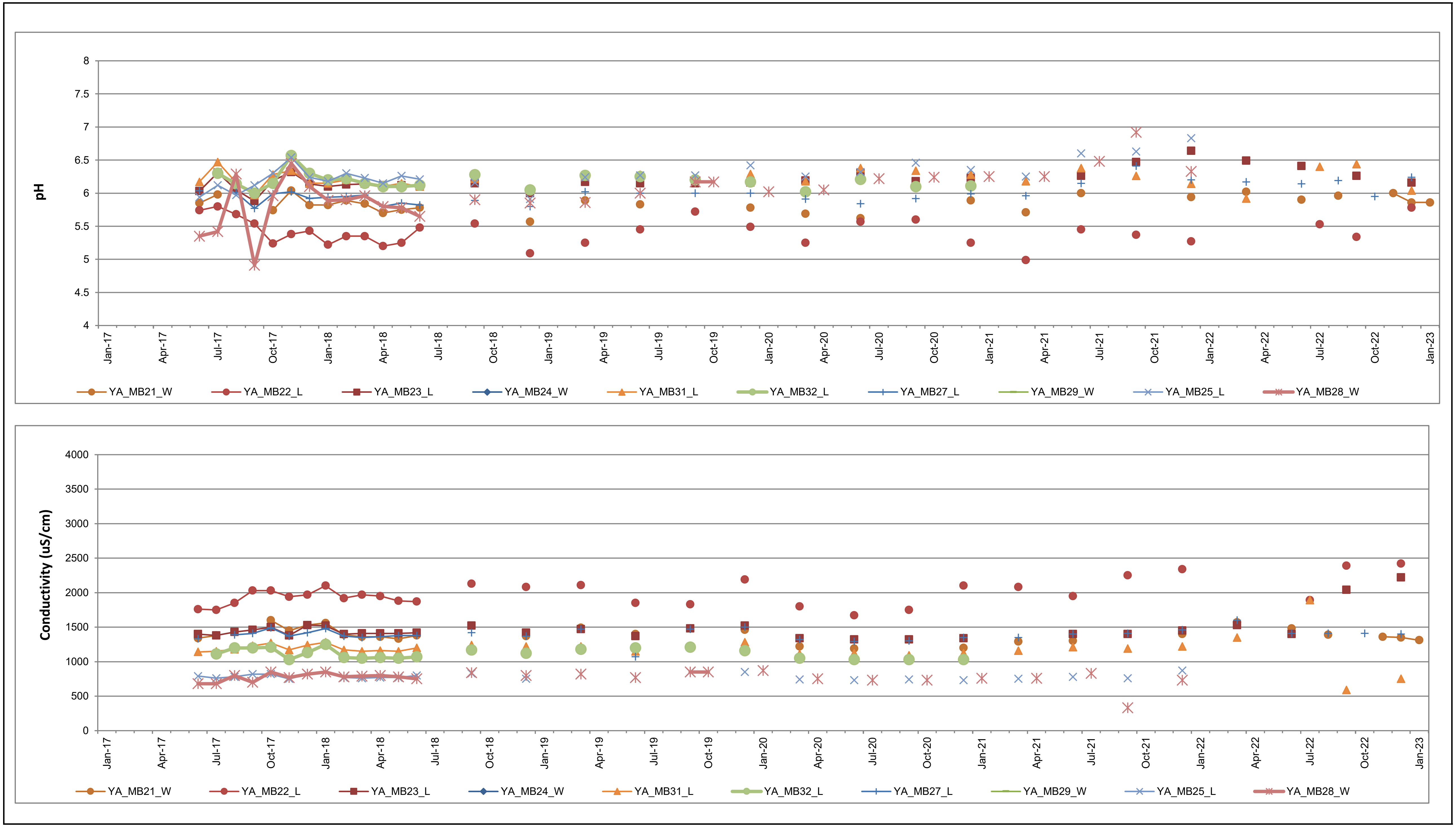
LABORATORY CHEMISTRY (ALUMINIUM, IRON, MANGANESE)YAMB18W, TS01M, YAMB01S, YAMB09S AND SCPD29A, JANUARY TO DECEMBER 2022 FIGURE 25b





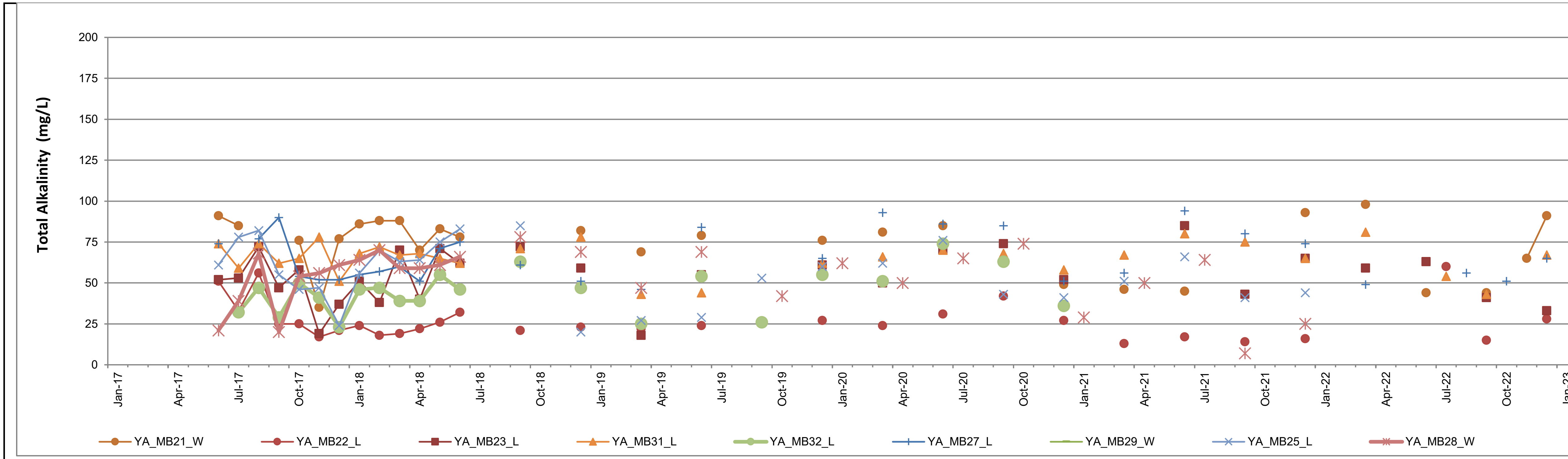


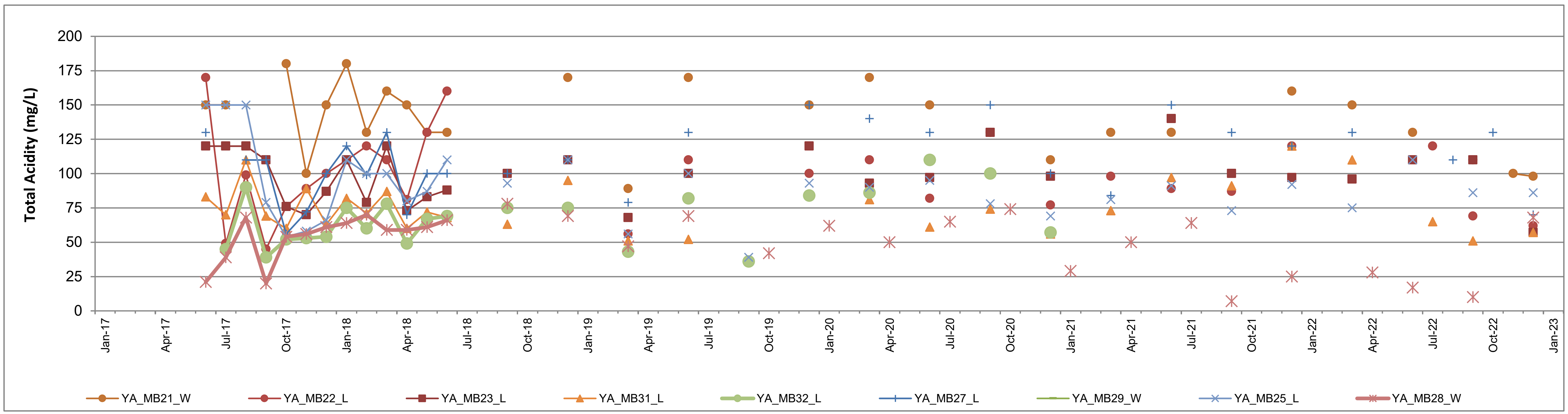
LABORATORY CHEMISTRY (ALUMINIUM, IRON, MANGANESE) YAMB07S, YAMB08S, YAMB10S, YAMB11S AND SCPD28A, JANUARY TO DECEMBER 2022 FIGURE 25c



AQ2

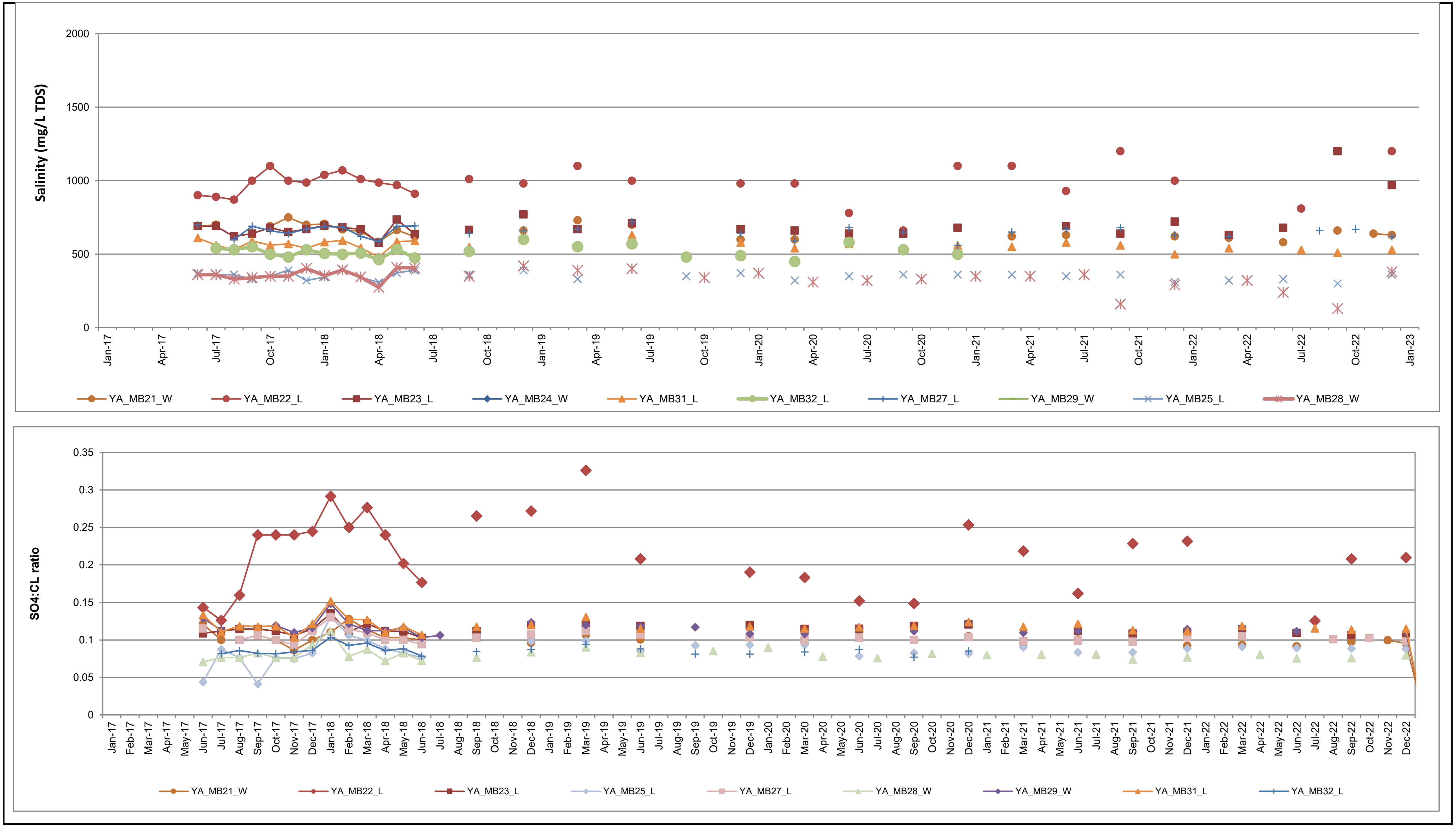
HISTORICAL FIELD pH & EC DATA (LEEDERVILLE AQUIFER) FIGURE 26



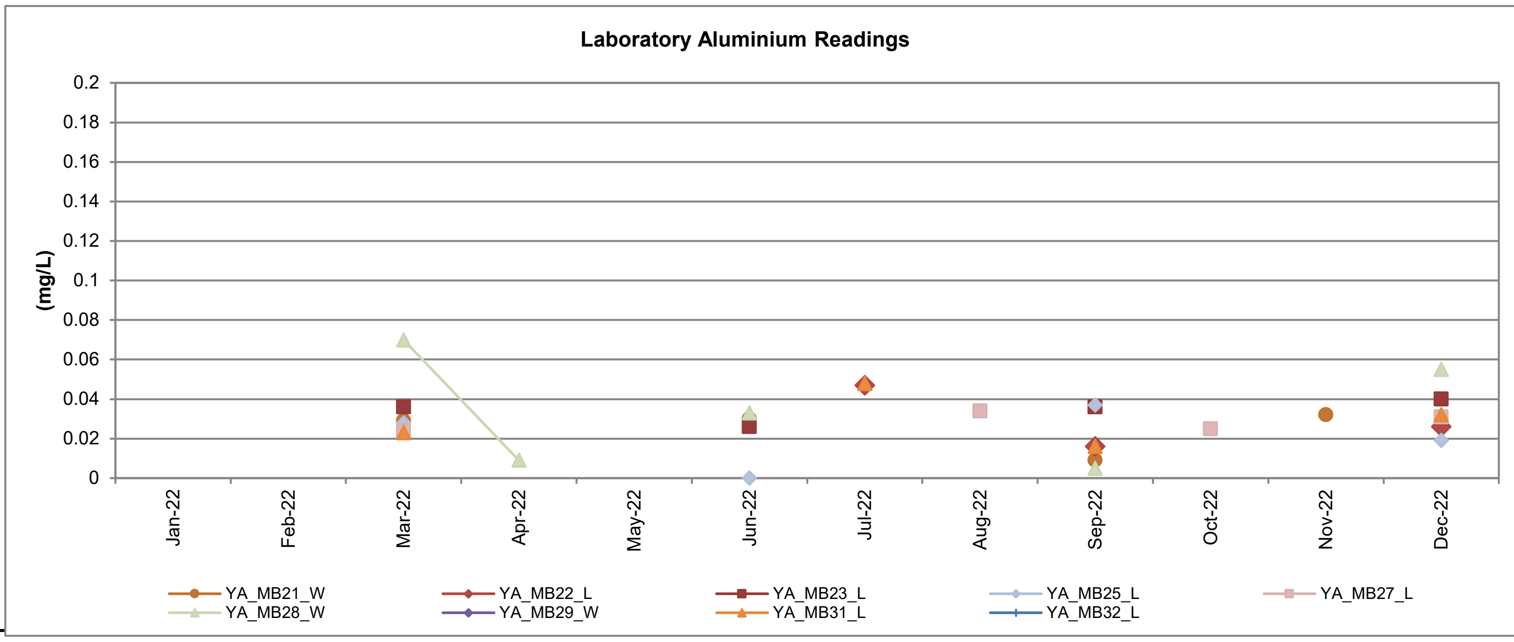


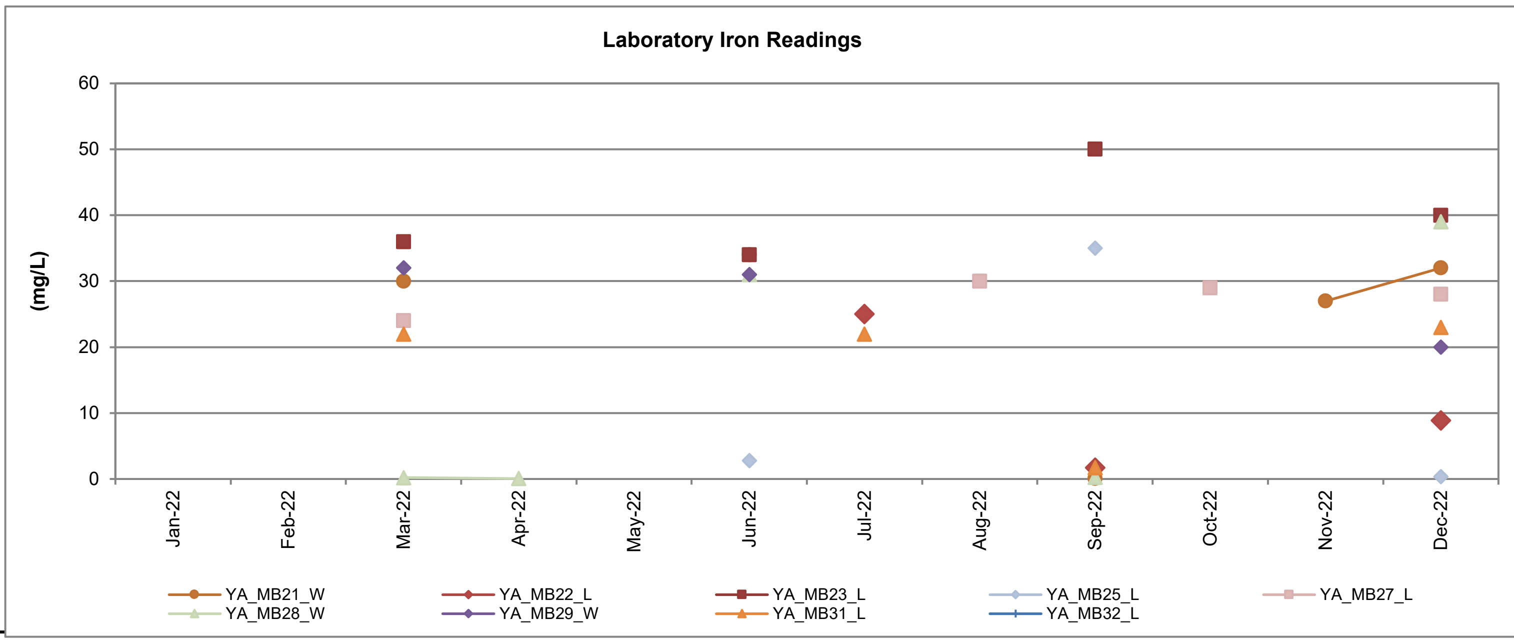
AQ2

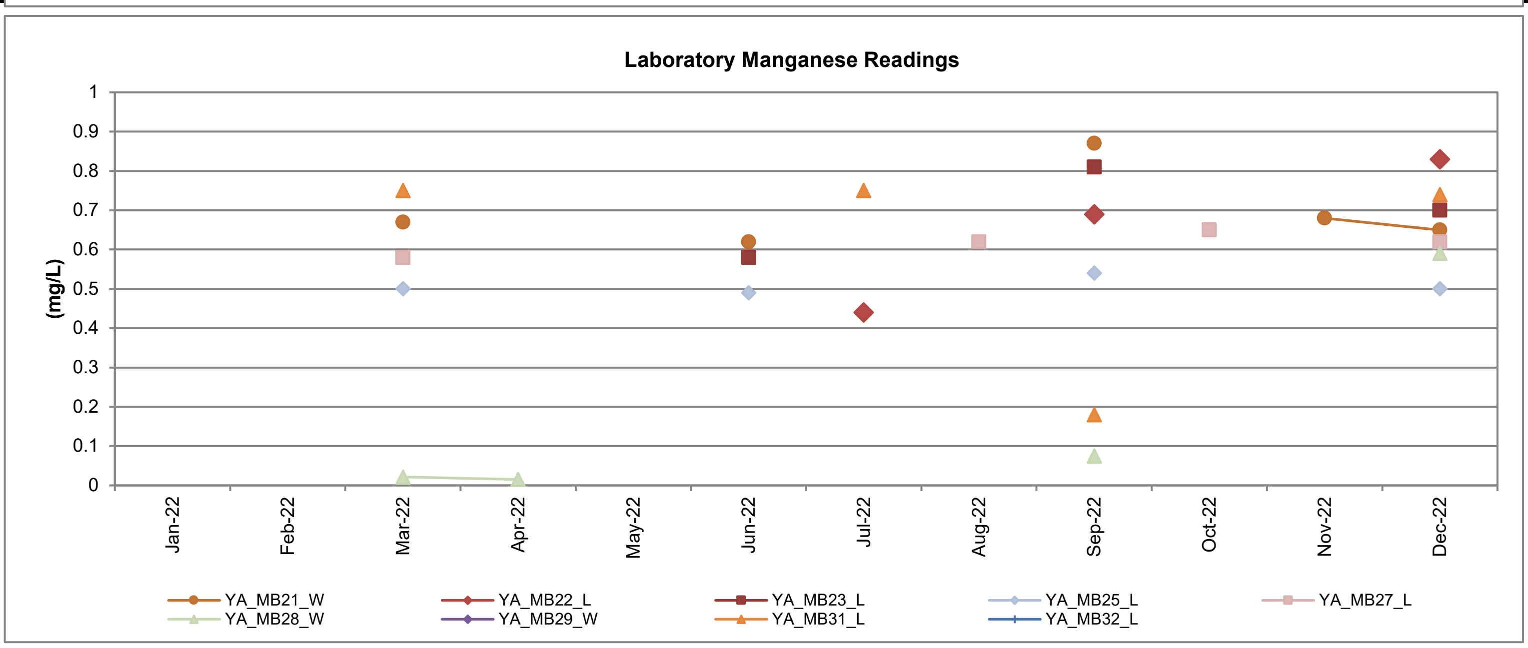
HISTORICAL LABORATORY TOTAL ALKALINITY & ACIDITY DATA (LEEDERVILLE AQUIFER) Figure 27



HISTORICAL LABORATORY SALINITY (TDS) DATA (LEEDERVILLE AQUIFER) FIGURE 28

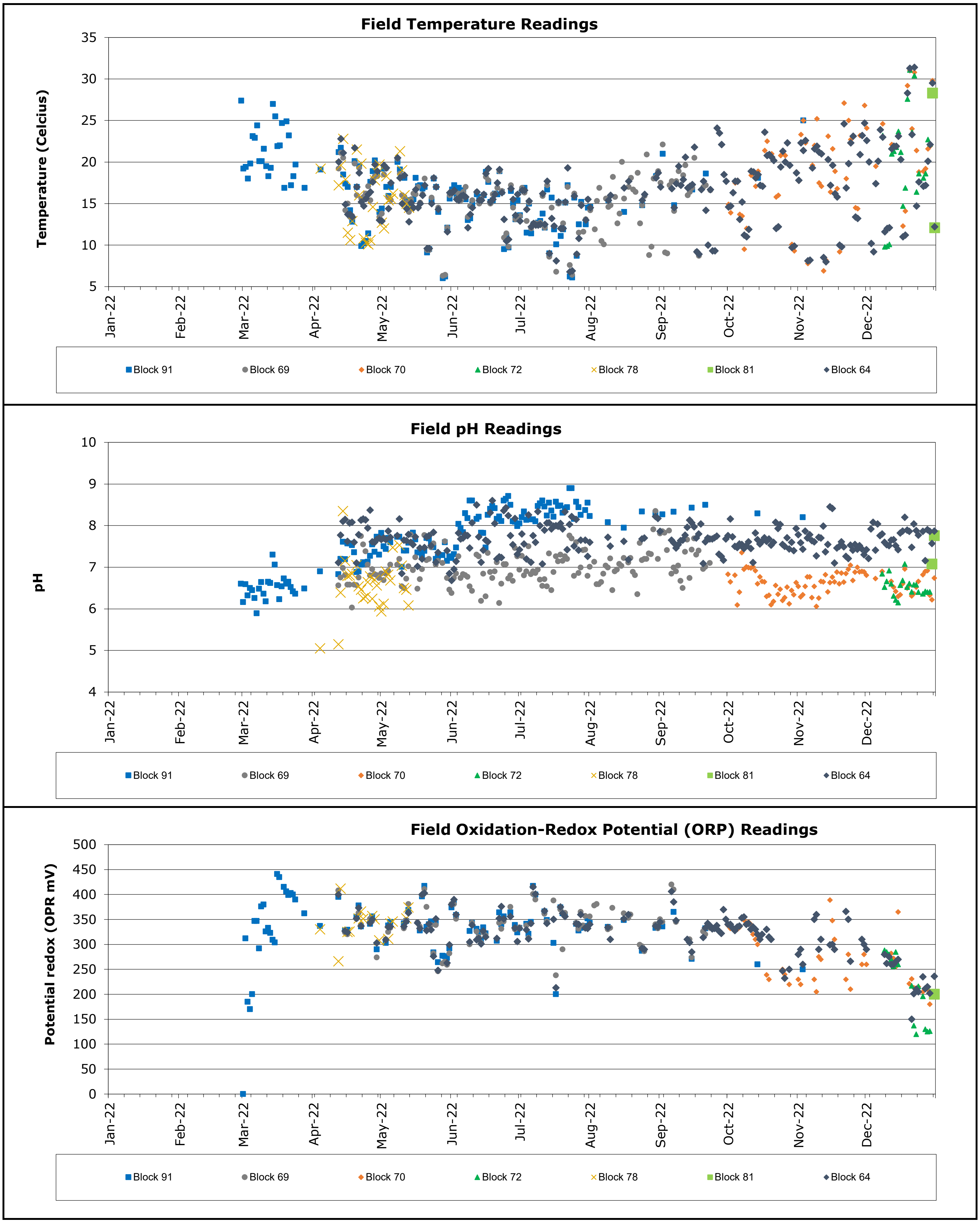






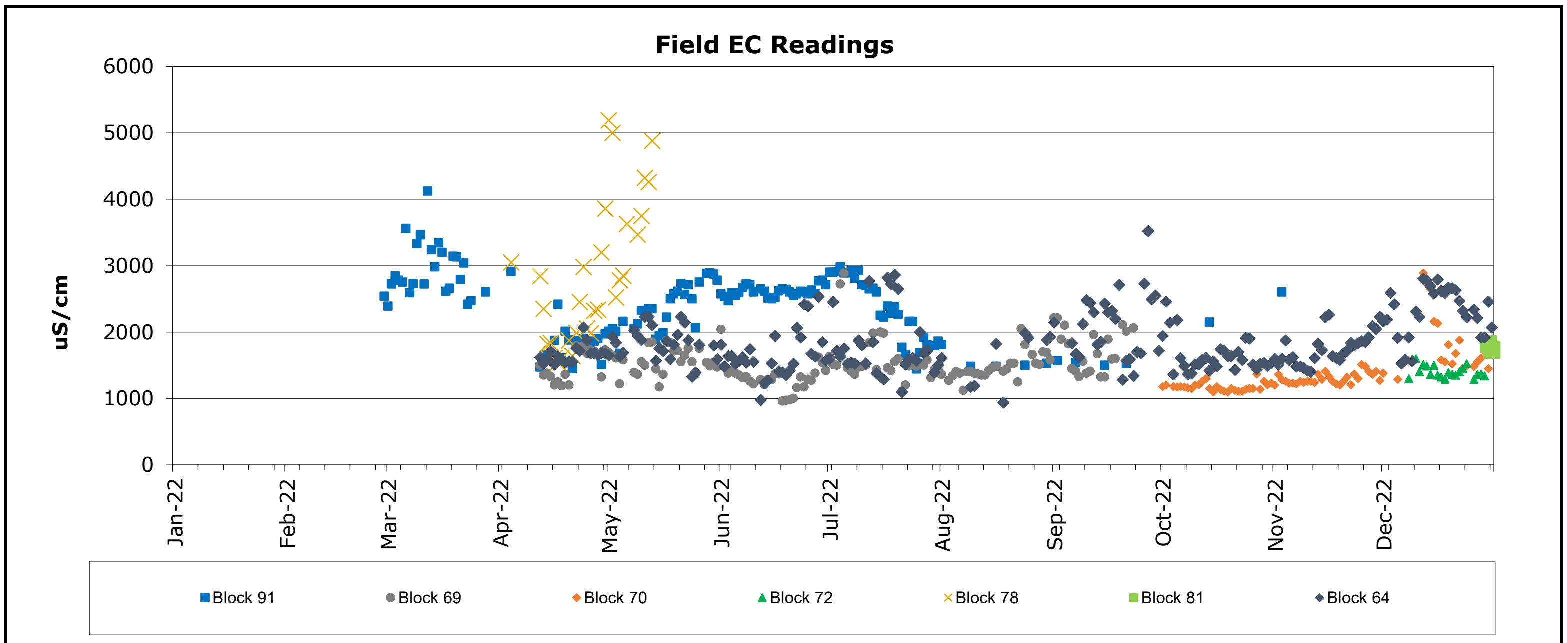
AQ2

LABORATORY CHEMISTRY (ALUMINIUM, IRON, MANGANESE) LEEDERVILLE MONITORING BORES, JANUARY TO DECEMBER 2022 FIGURE 29

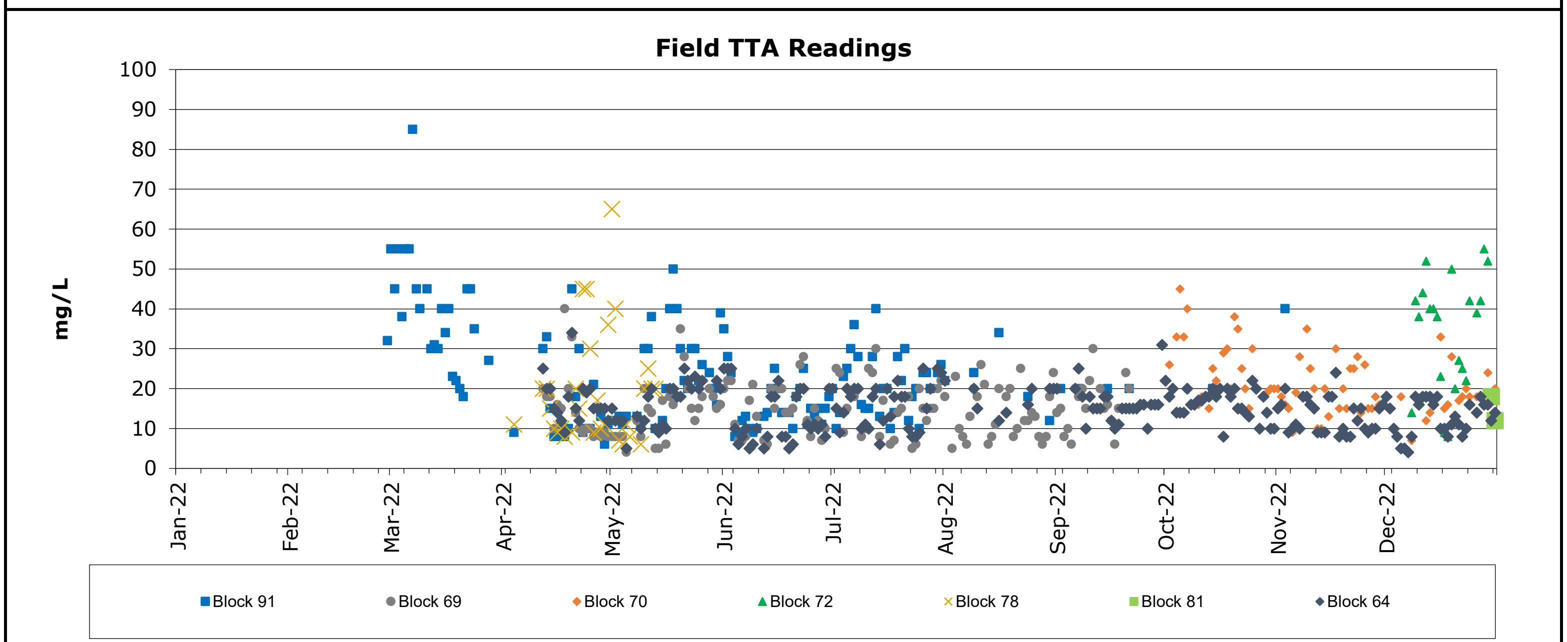


AQ2

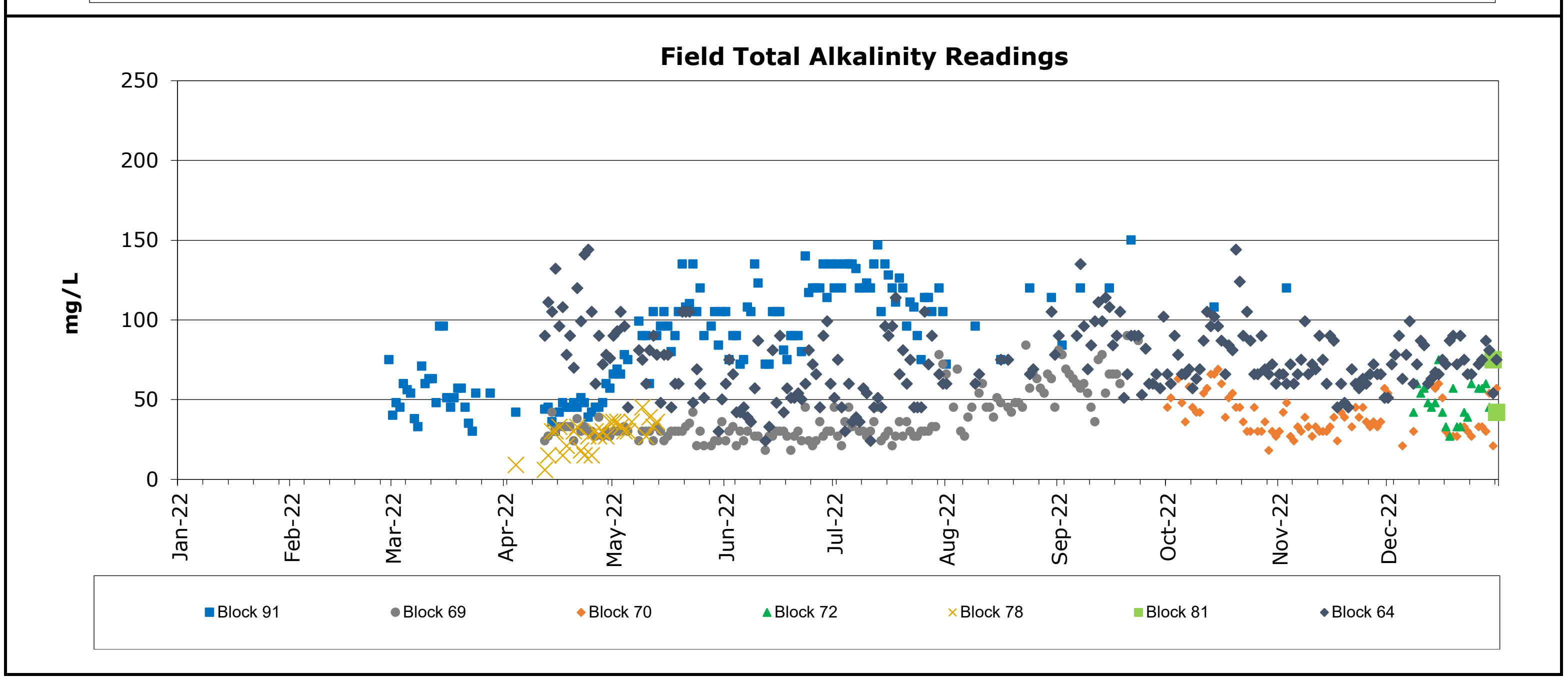
PIT DEWATERING FIELD CHEMISTRY FIGURE 30a



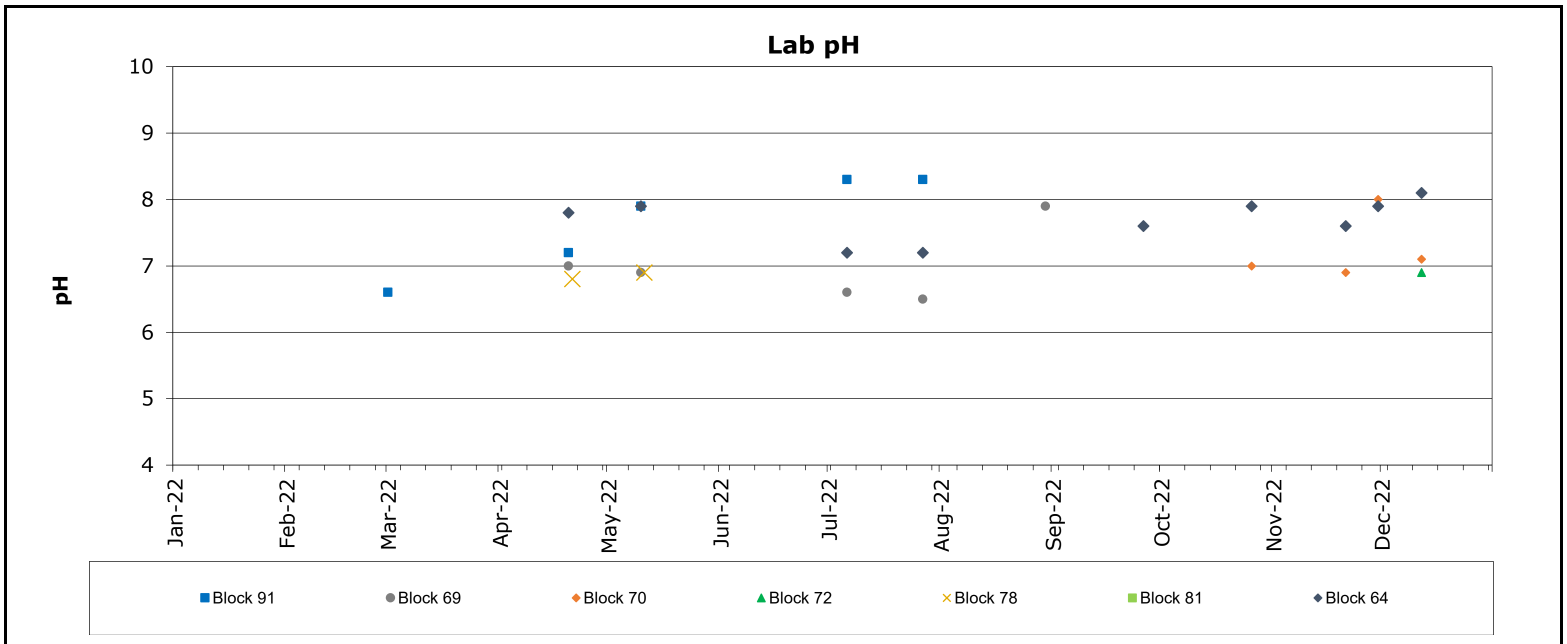
Field EC Readings
uS/cm
6000
5000
4000
3000
2000
1000
0
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Block 91
Block 69
Block 70
Block 72
Block 78
Block 81
Block 64

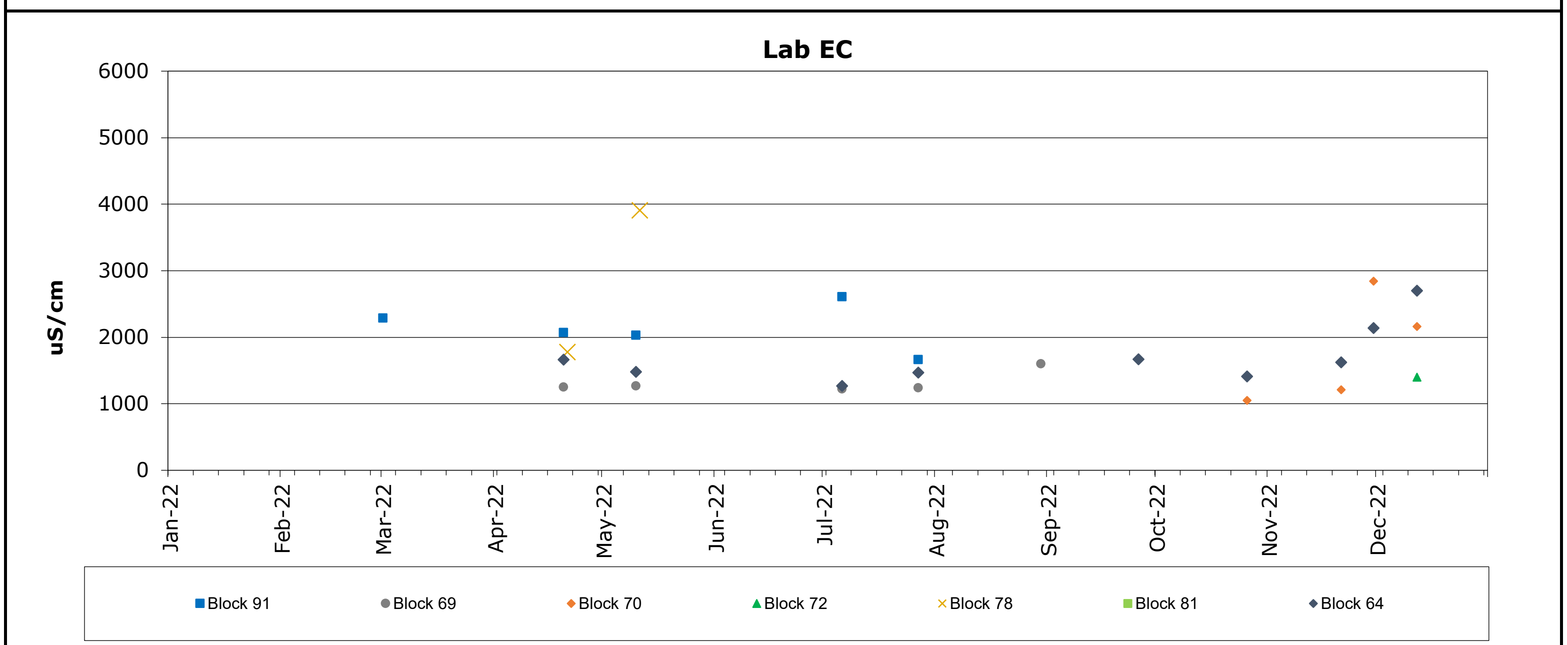


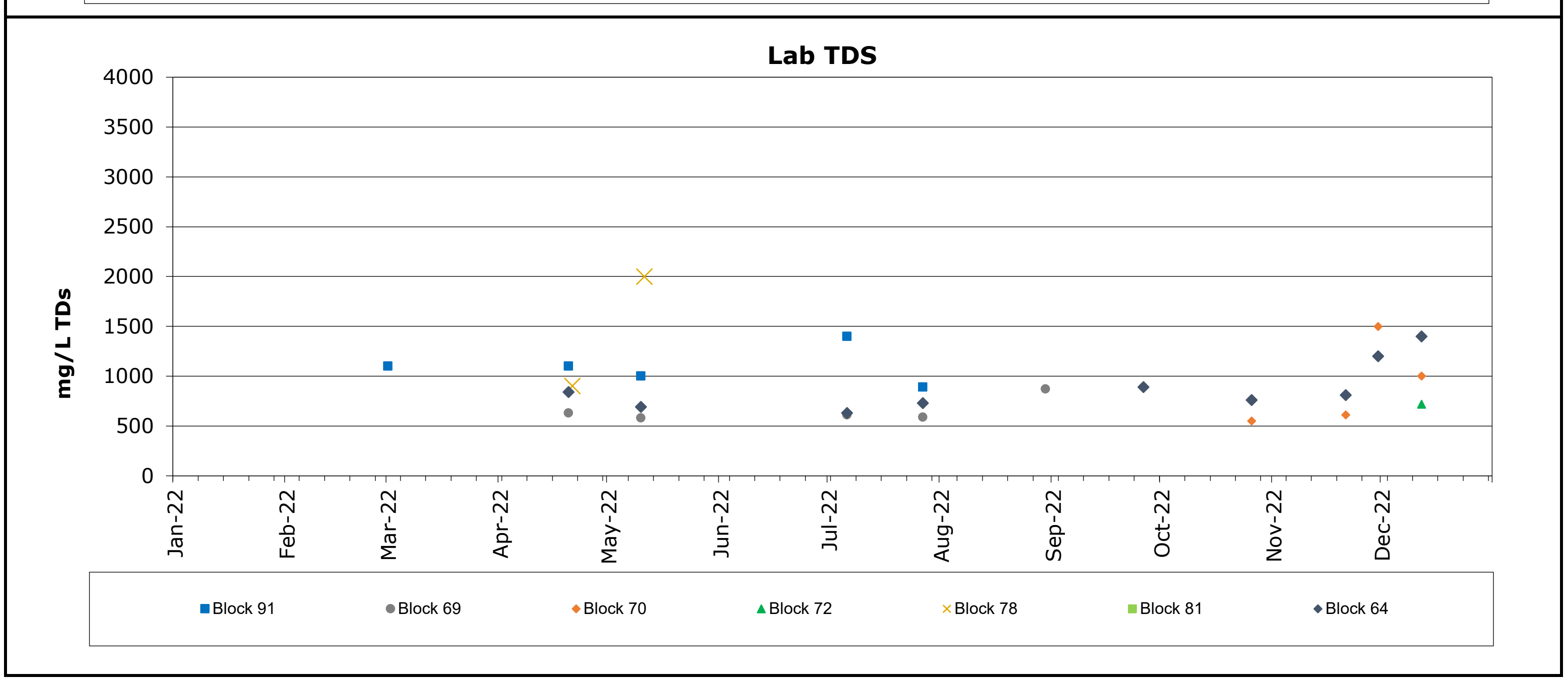
Field TTA Readings
mg/L
100
90
80
70
60
50
40
30
20
10
0
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Block 91
Block 69
Block 70
Block 72
Block 78
Block 81
Block 64

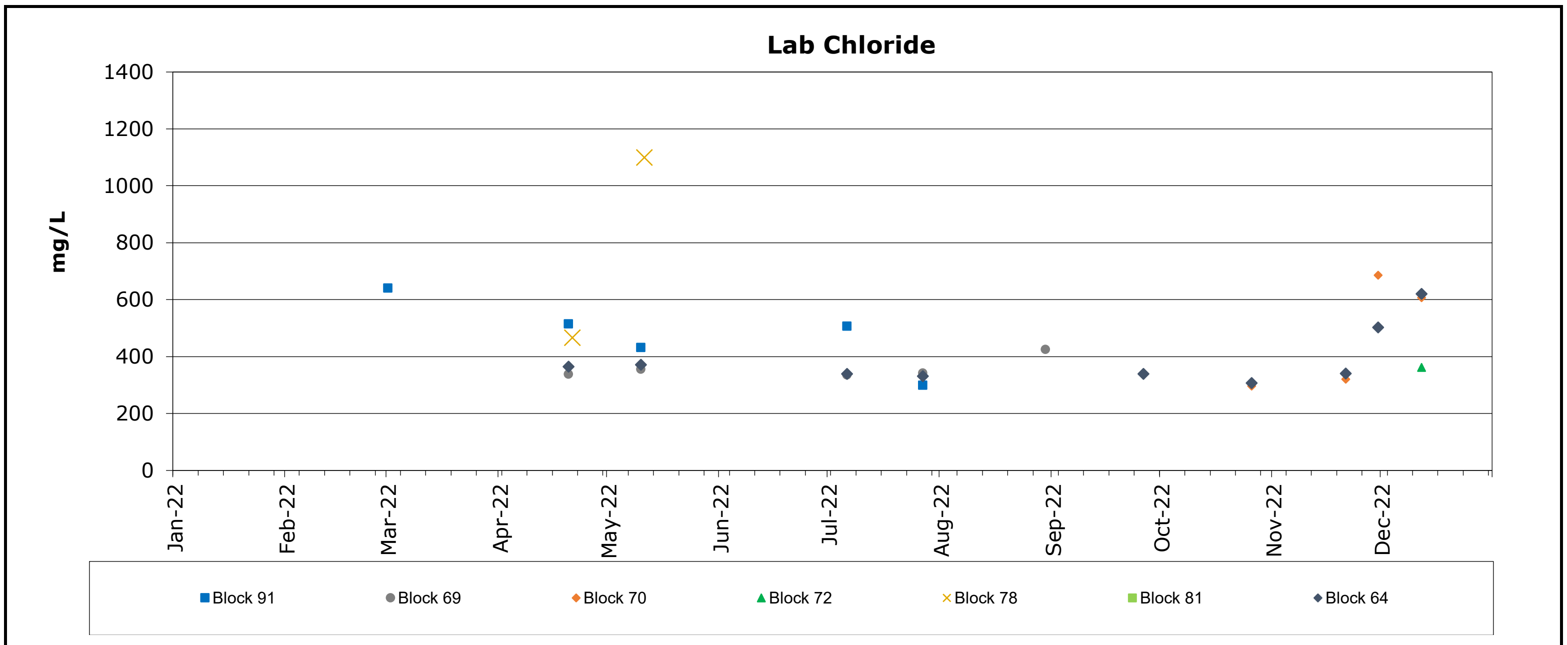


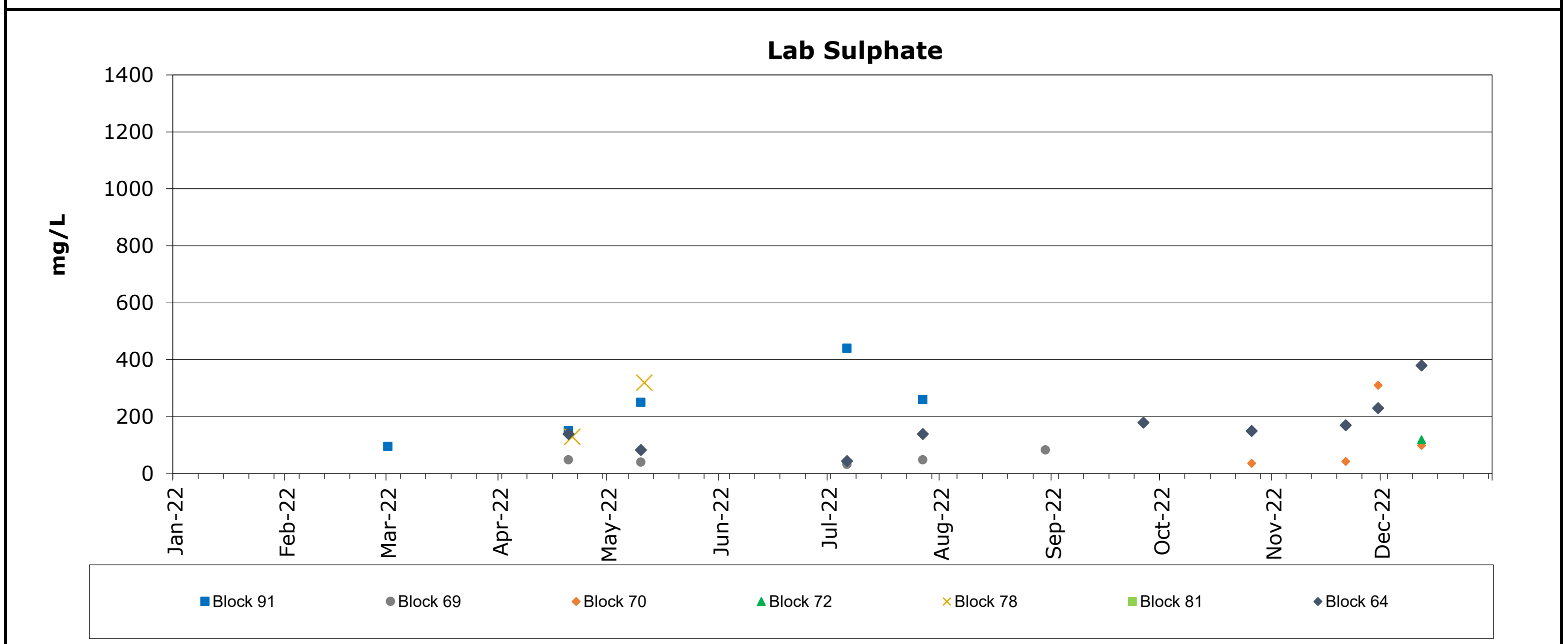
Field Total Alkalinity Readings
mg/L
250
200
150
100
50
0
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Block 91
Block 69
Block 70
Block 72
Block 78
Block 81
Block 64

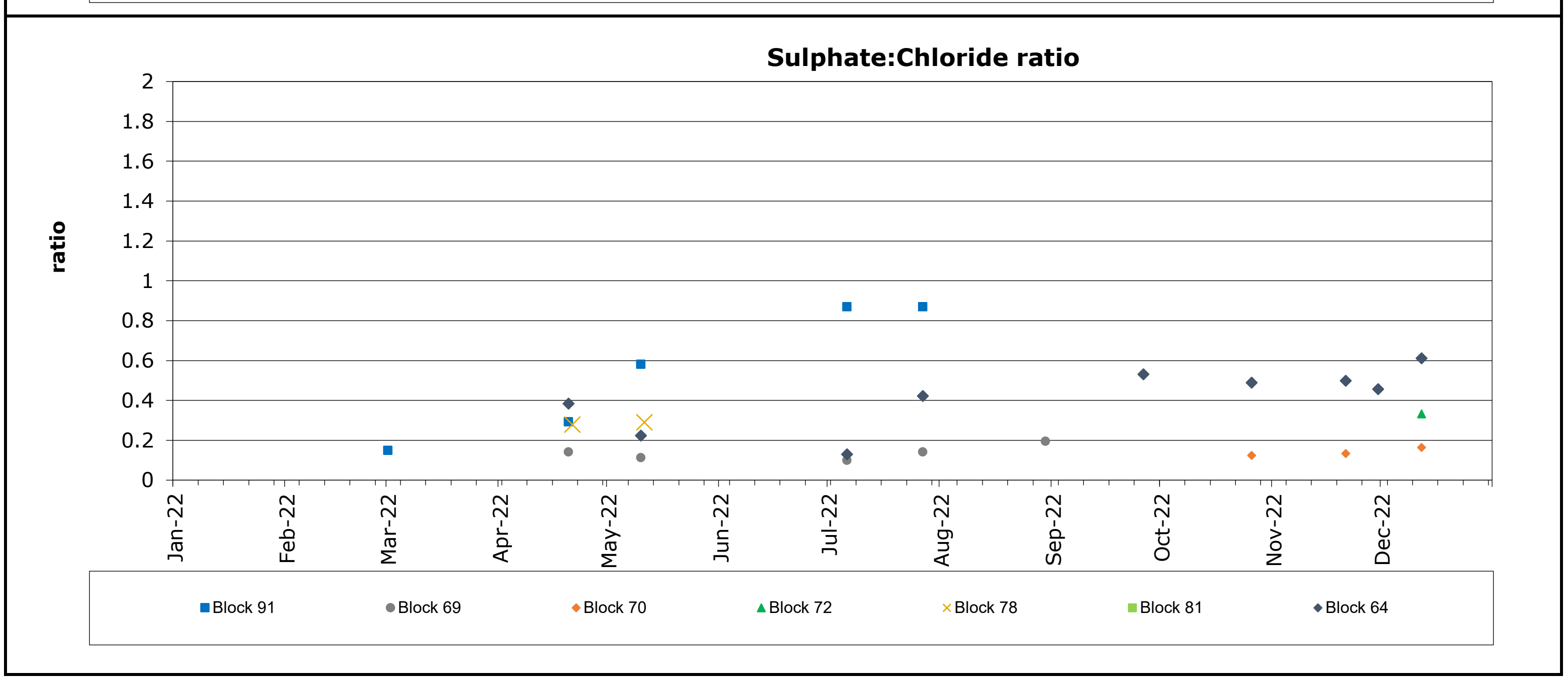

Lab pH
pH
10
9
8
7
6
5
4
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Block 91
Block 69
Block 70
Block 72
Block 78
Block 81
Block 64

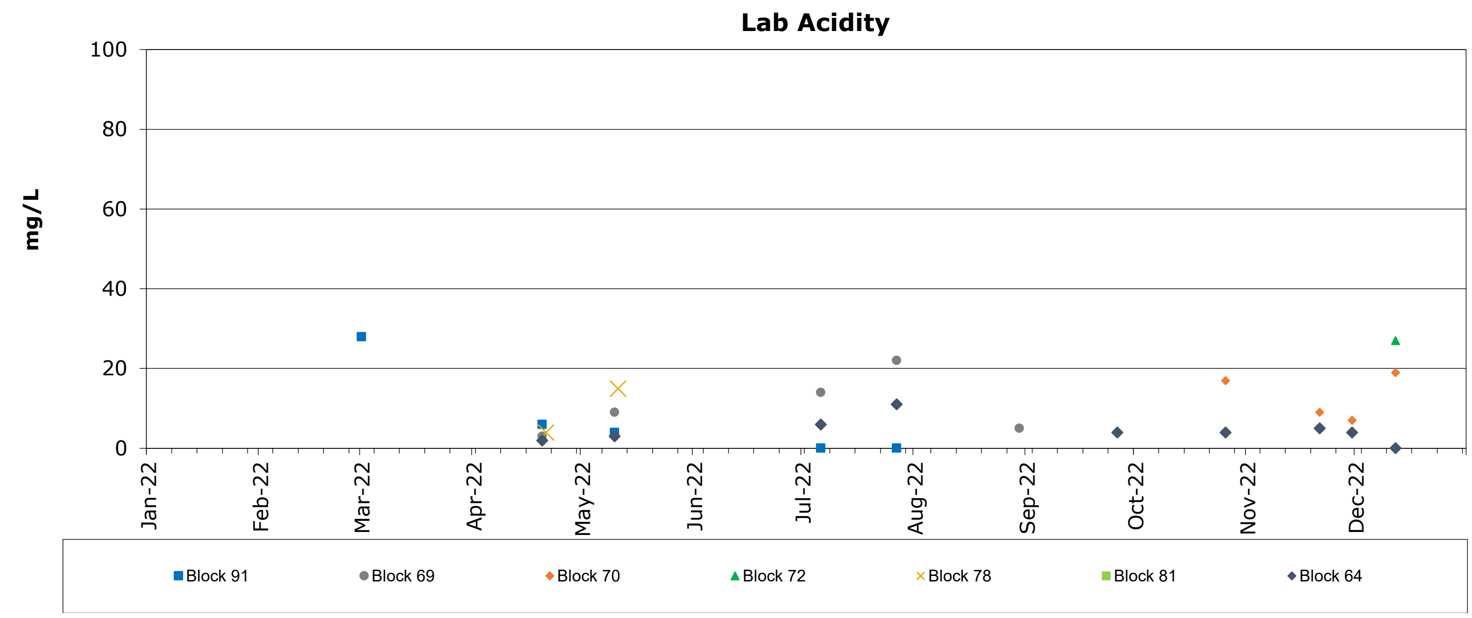

Lab EC
uS/cm
6000
5000
4000
3000
2000
1000
0
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Block 91
Block 69
Block 70
Block 72
Block 78
Block 81
Block 64


Lab TDS
mg/L TDs
4000
3500
3000
2500
2000
1500
1000
500
0
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Block 91
Block 69
Block 70
Block 72
Block 78
Block 81
Block 64

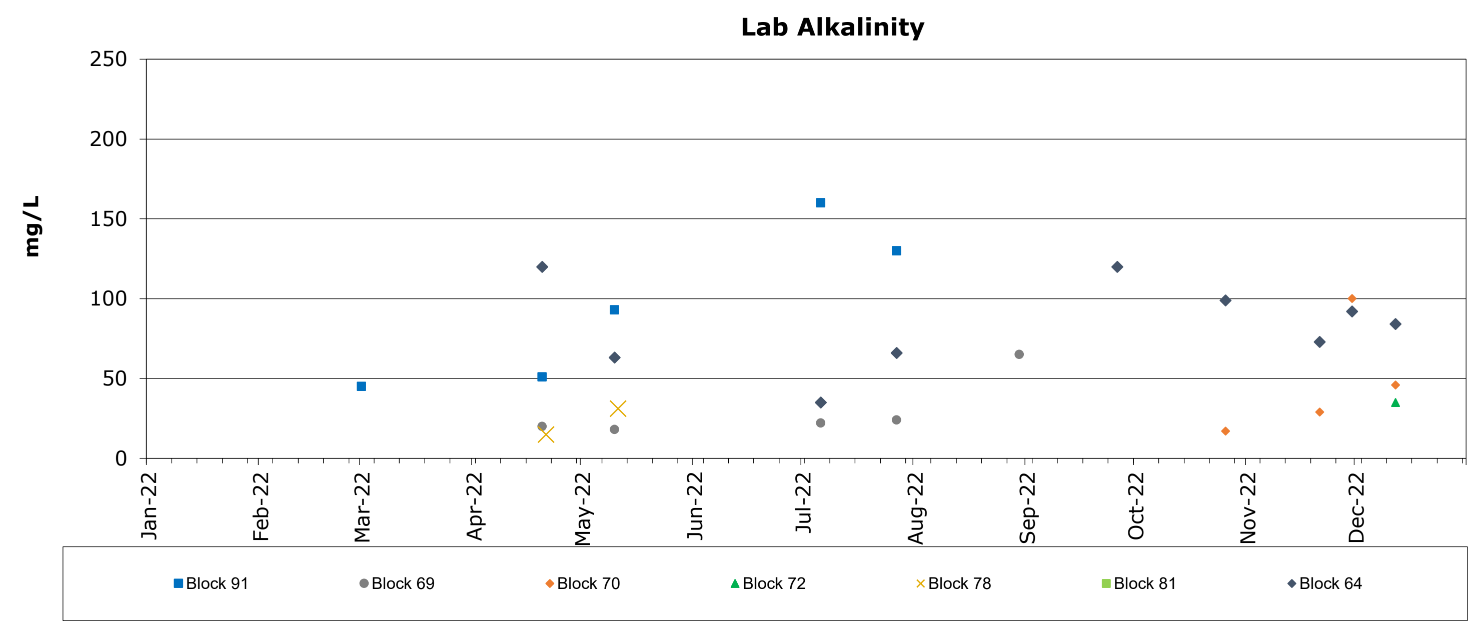

Lab Chloride
mg/L
1400
1200
1000
800
600
400
200
0
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Block 91
Block 69
Block 70
Block 72
Block 78
Block 81
Block 64


Lab Sulphate
mg/L
1400
1200
1000
800
600
400
200
0
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Block 91
Block 69
Block 70
Block 72
Block 78
Block 81
Block 64


Sulphate:Chloride ratio
ratio
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Block 91
Block 69
Block 70
Block 72
Block 78
Block 81
Block 64

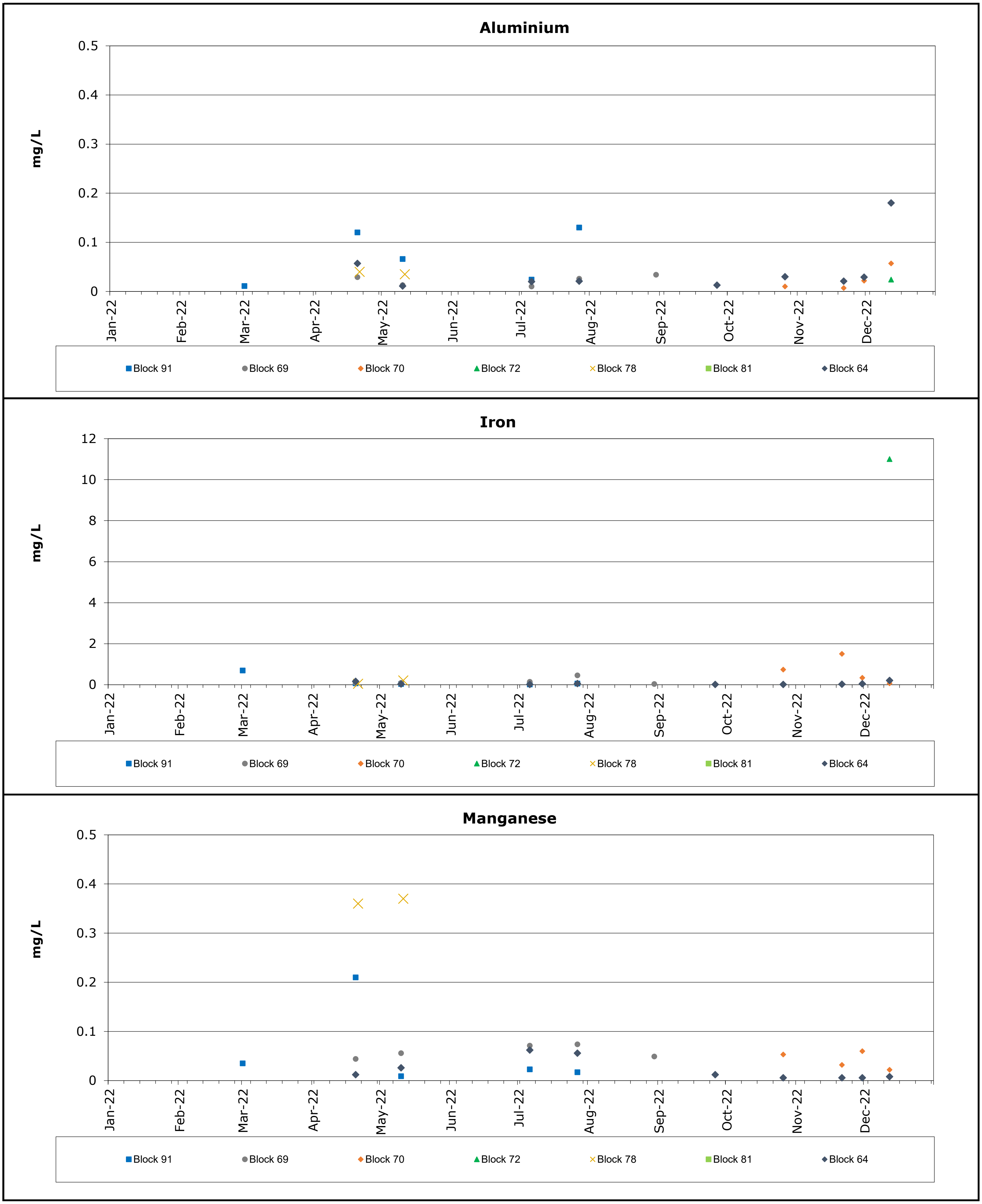


Lab Acidity
mg/L
100
80
60
40
20
0
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Block 91
Block 69
Block 70
Block 72
Block 78
Block 81
Block 64

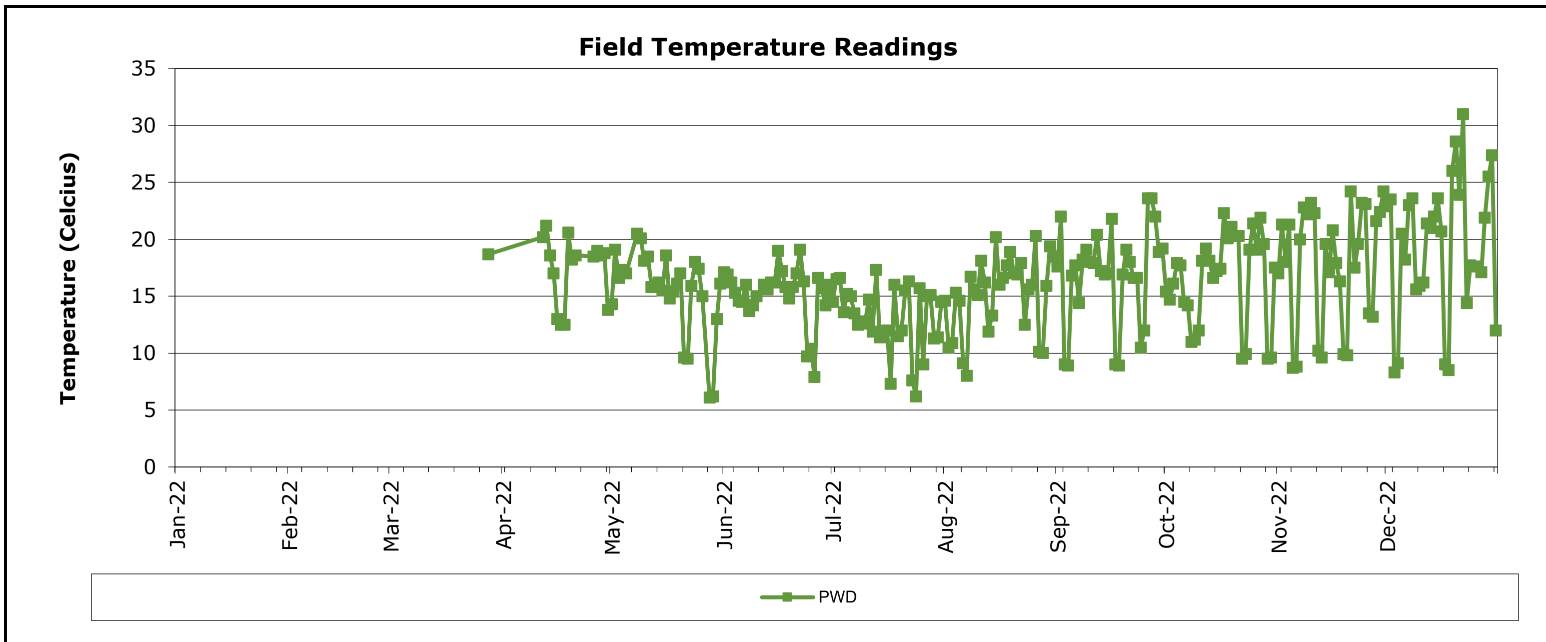


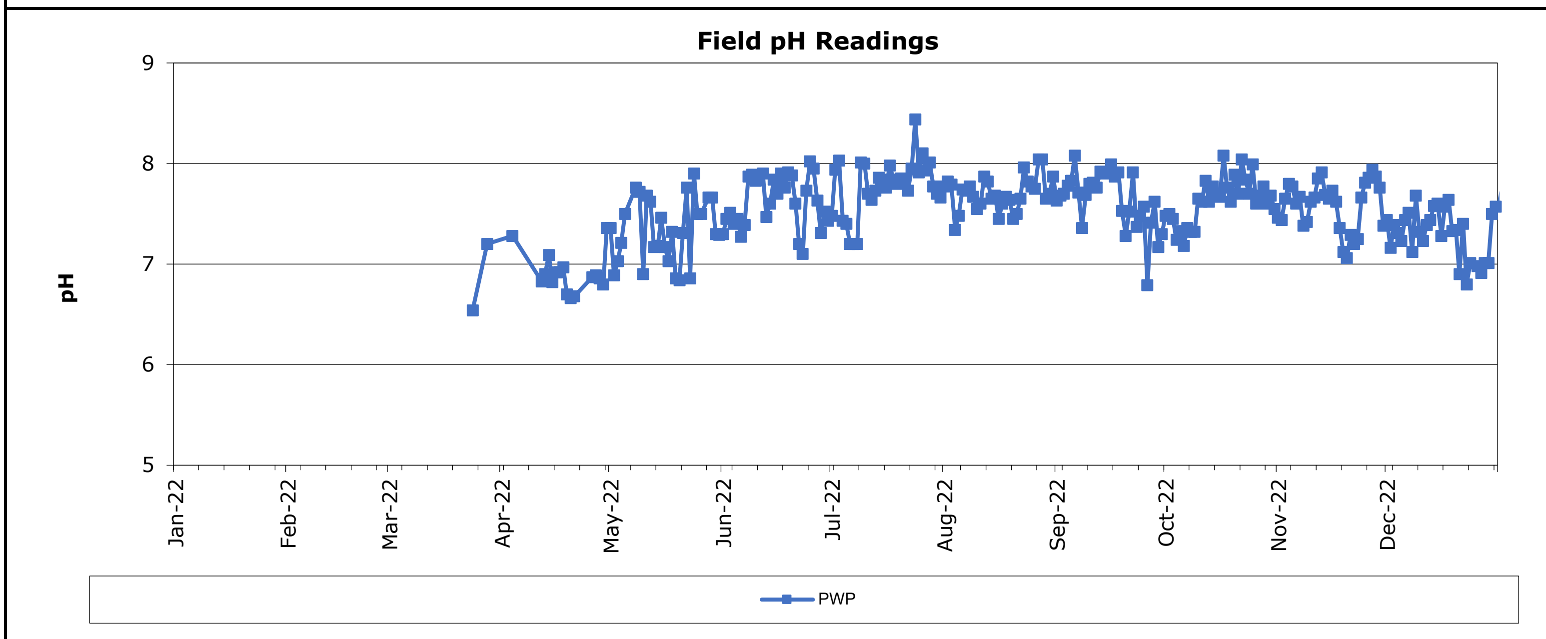
Lab Alkalinity
mg/L
250
200
150
100
50
0
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Block 91
Block 69
Block 70
Block 72
Block 78
Block 81
Block 64

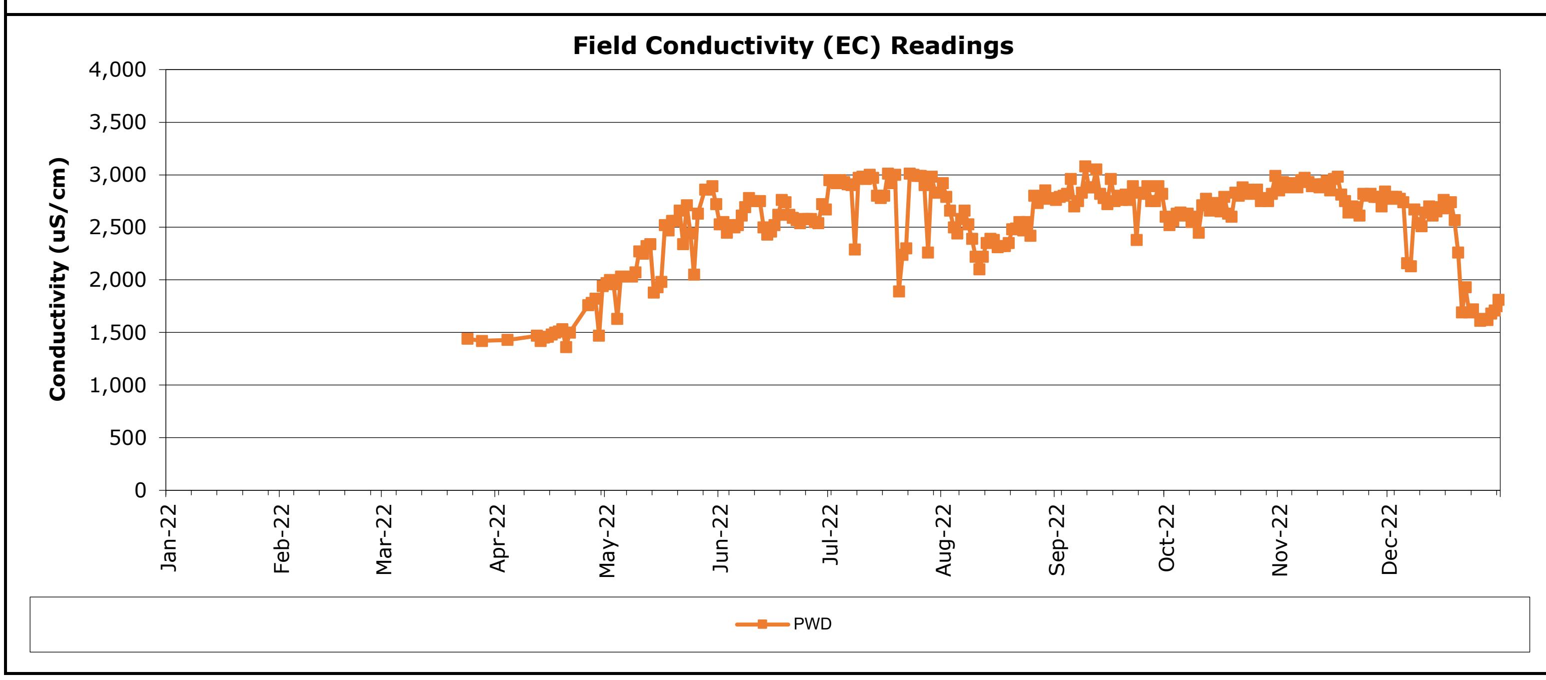
AQ2



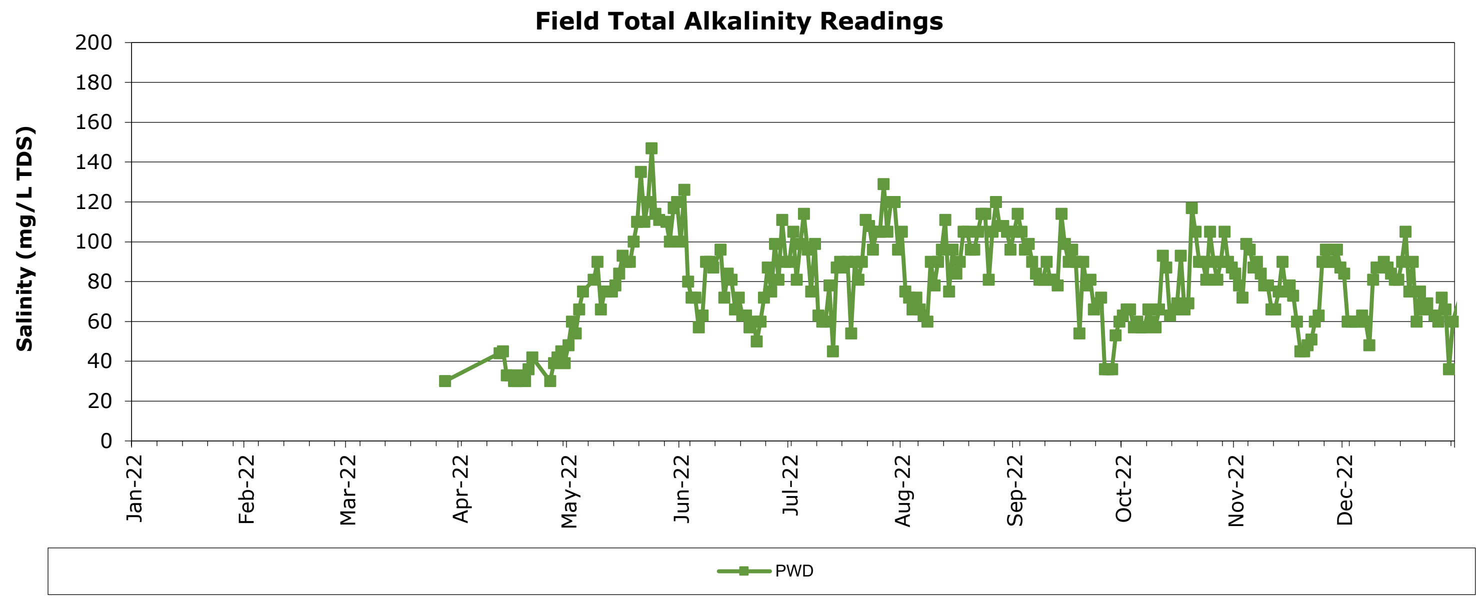
PIT DEWATERING LABORATORY CHEMISTRY FIGURE 31d

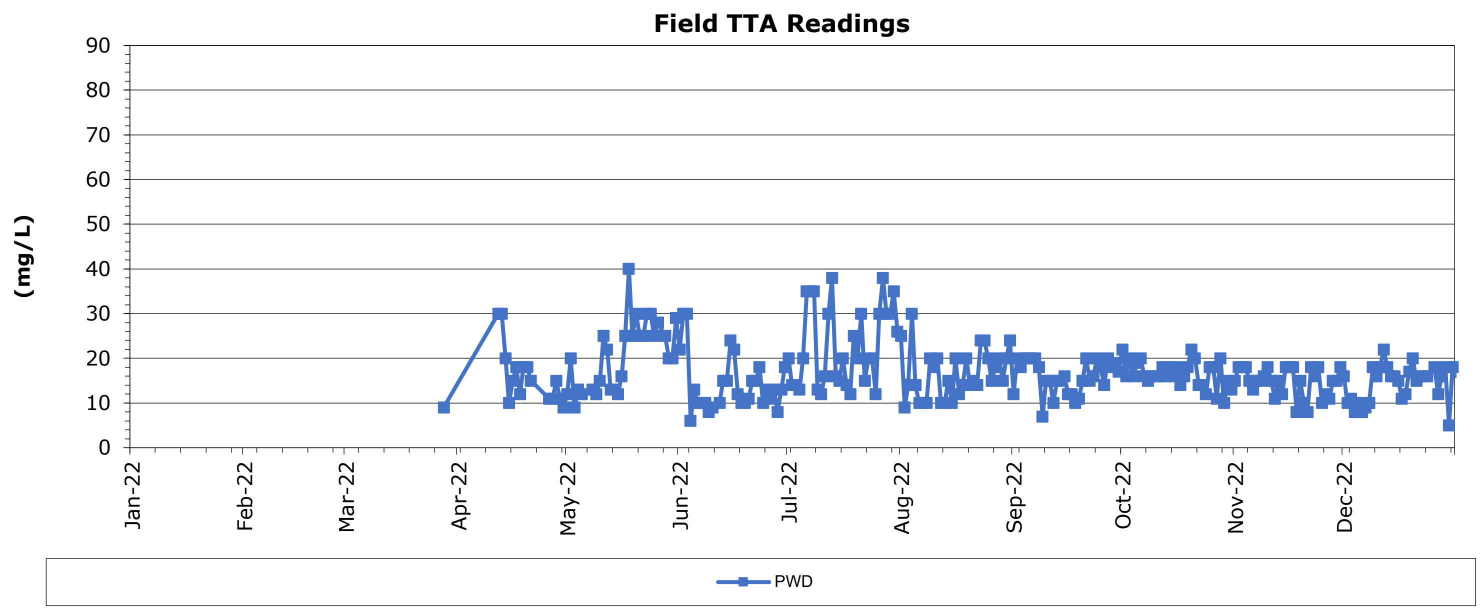






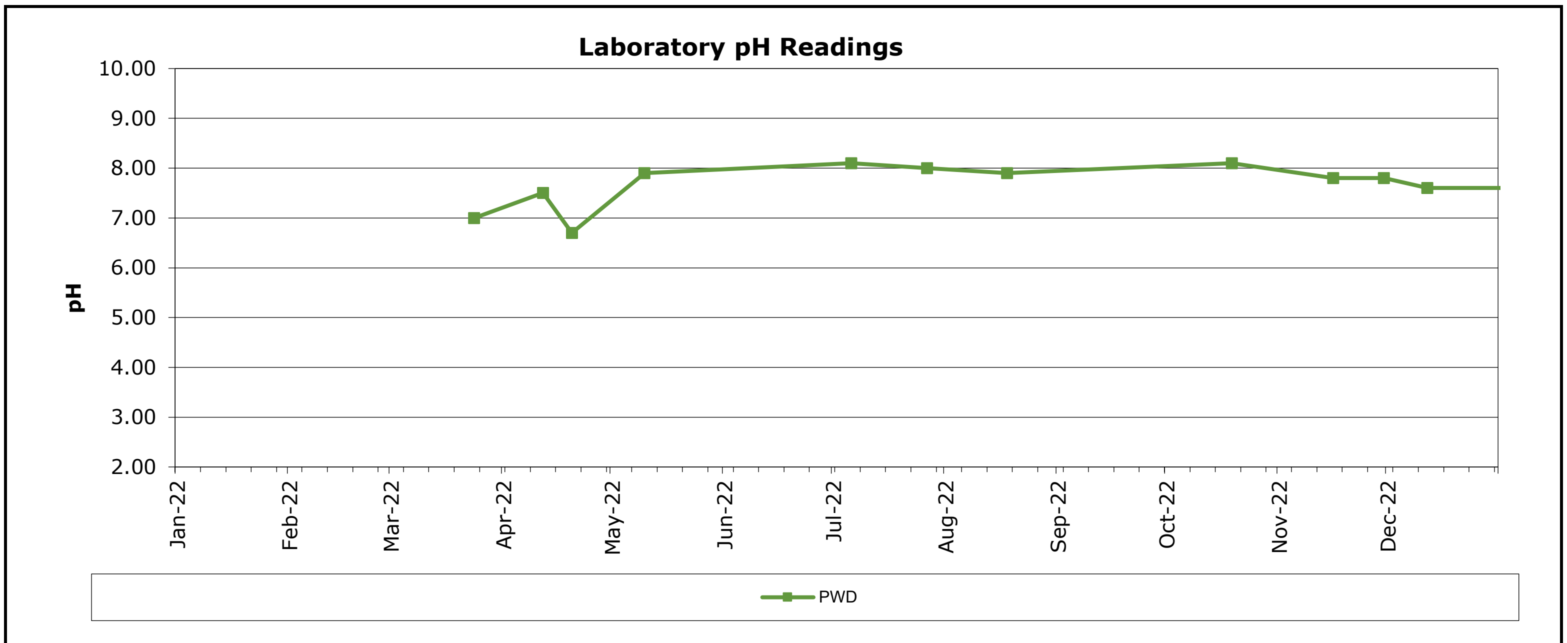
PROCESS WATER POND (PWD) FIELD CHEMISTRY FIGURE 32a

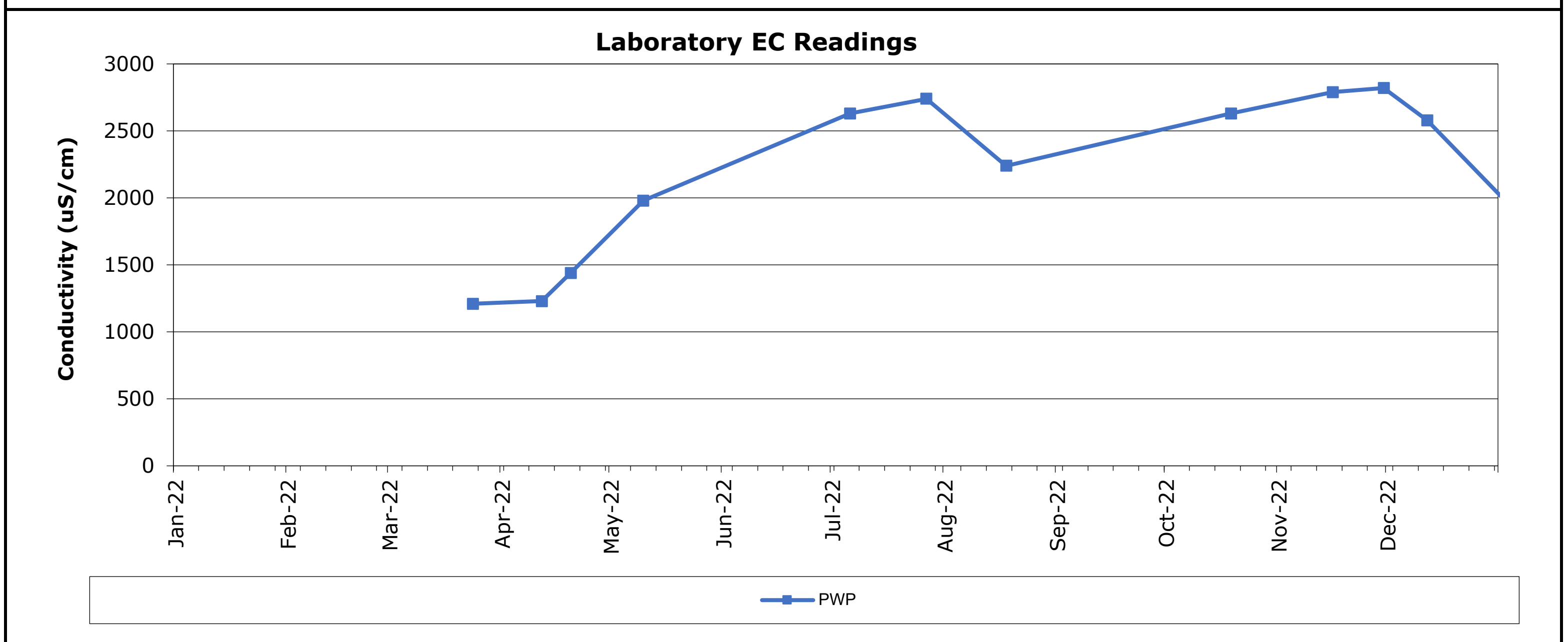


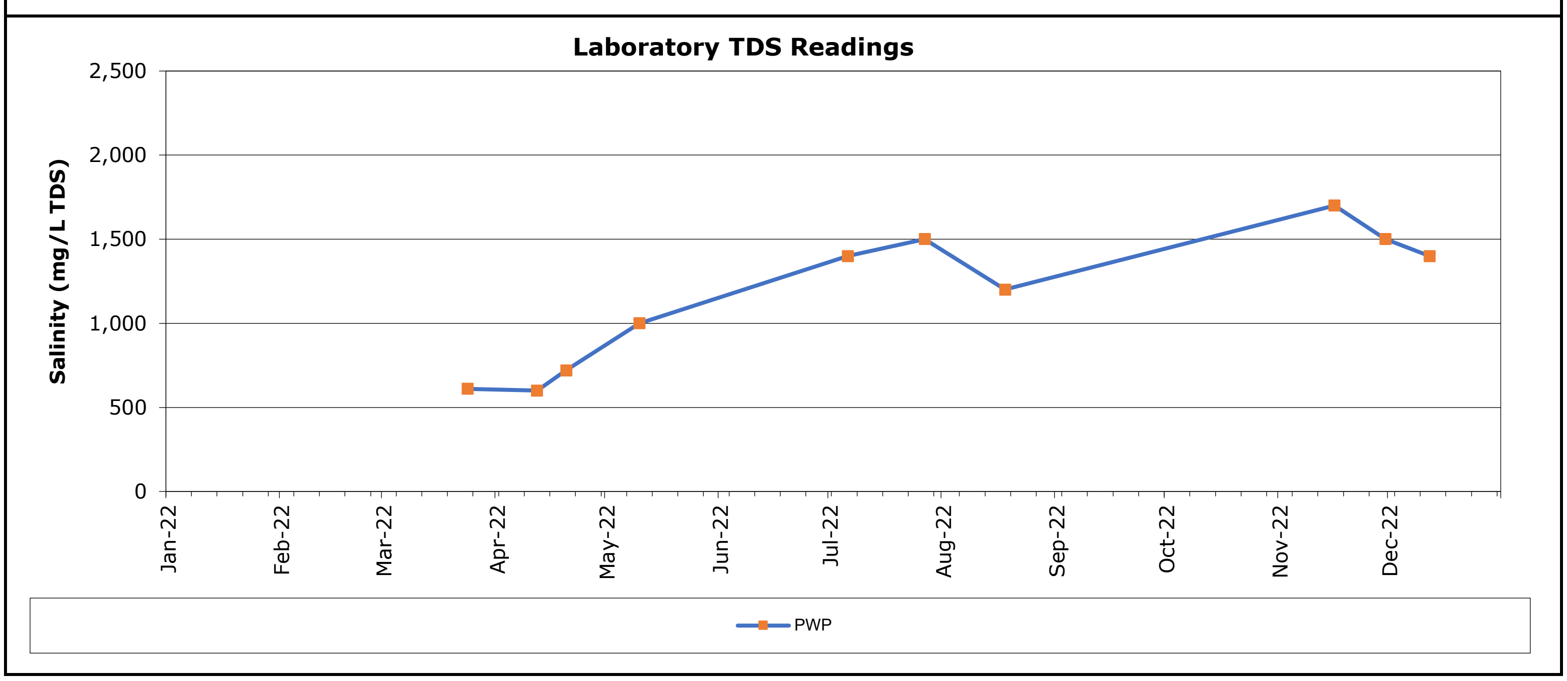


AQ2

PROCESS WATER POND (PWD) FIELD CHEMISTRY FIGURE 32b

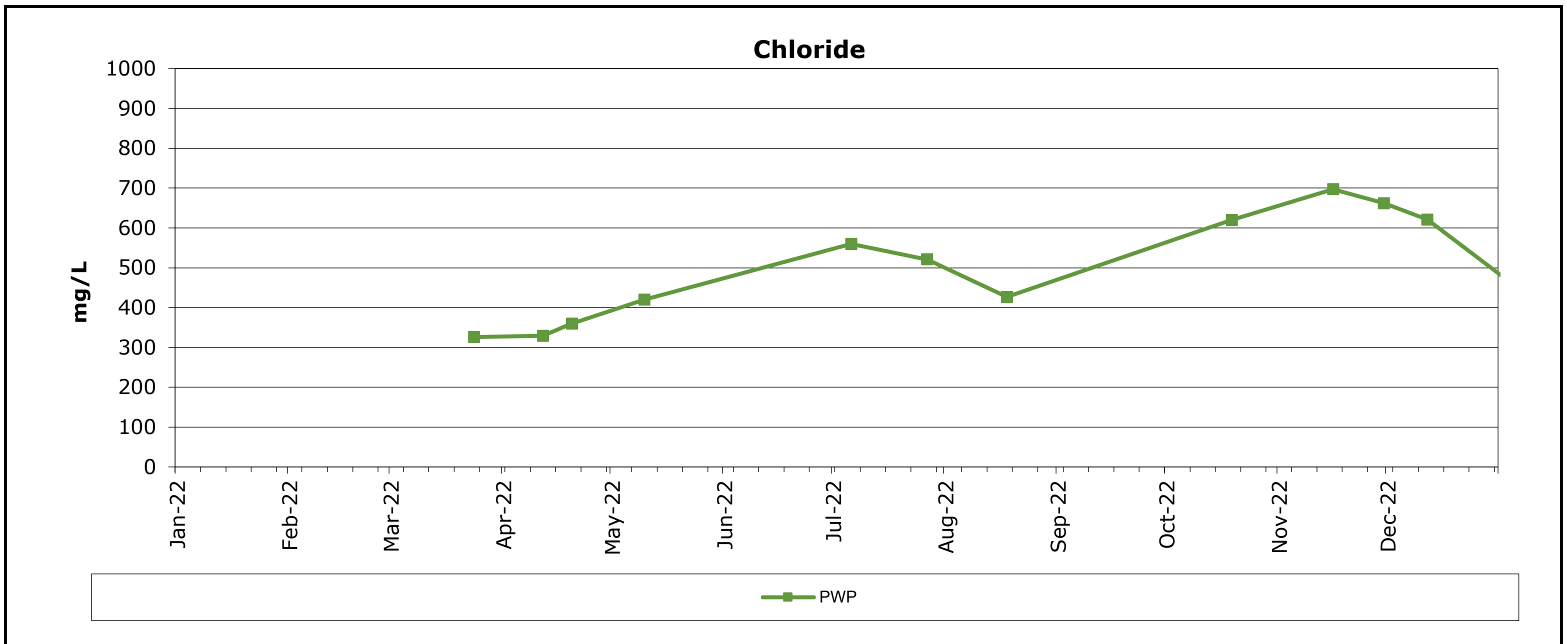


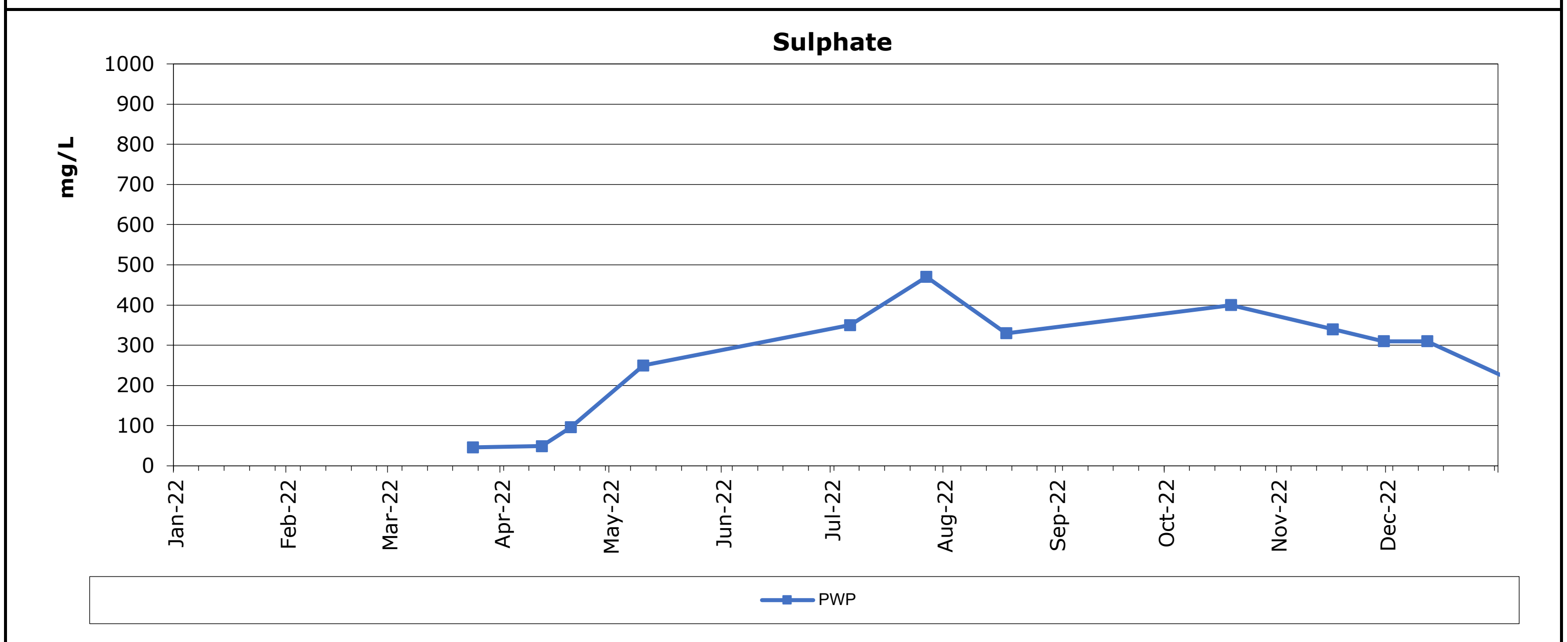


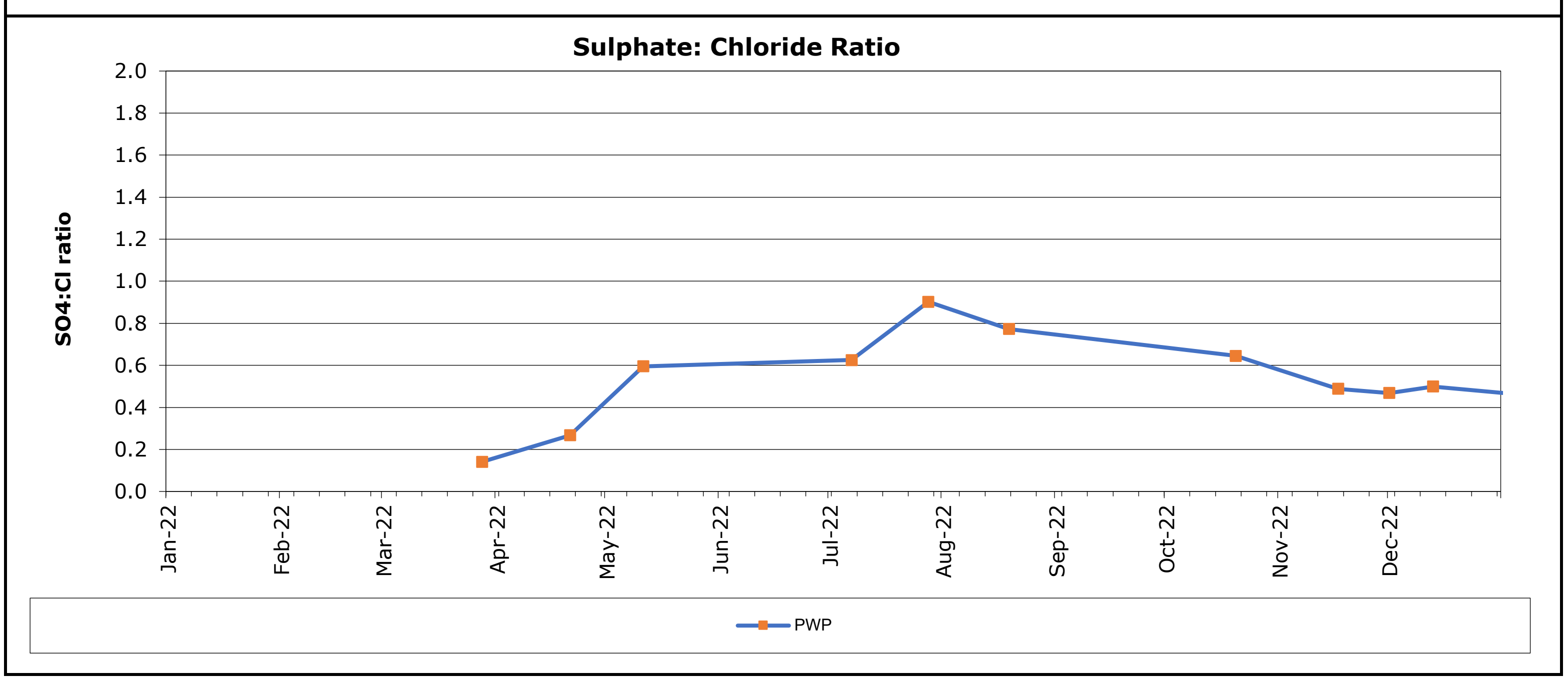


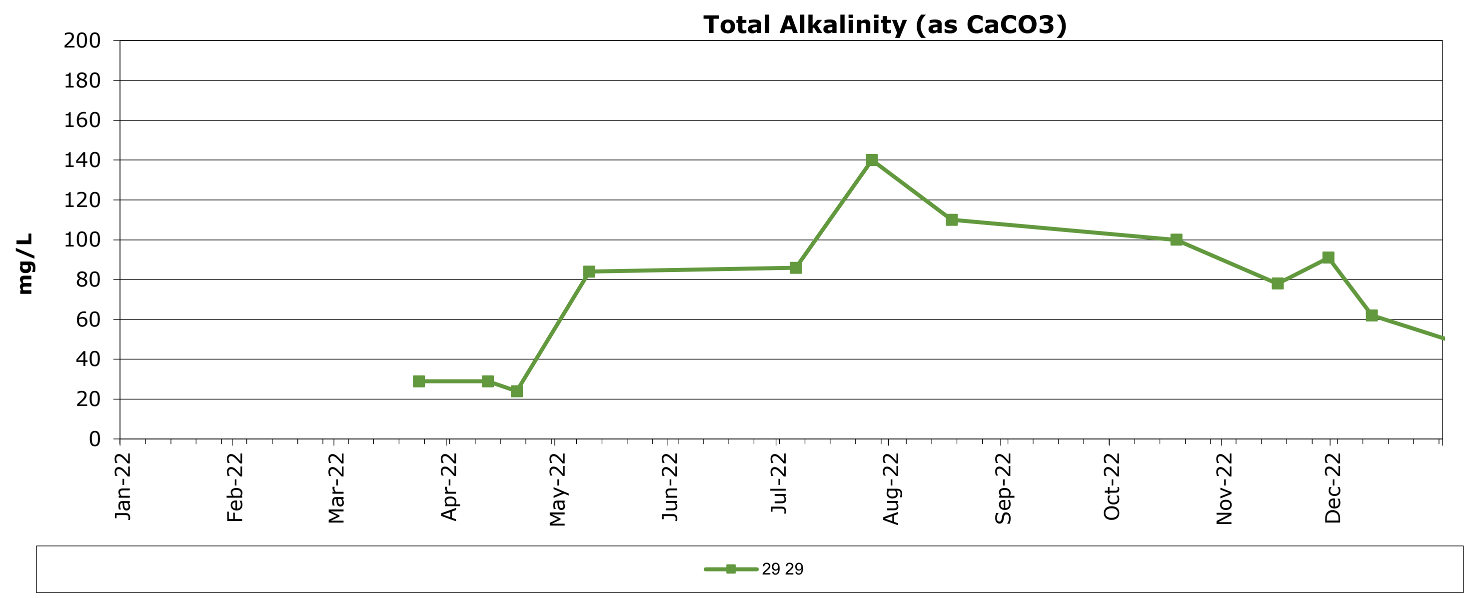
AQ2

PROCESS WATER POND (PWD) LABORATORY CHEMISTRY FIGURE 33a

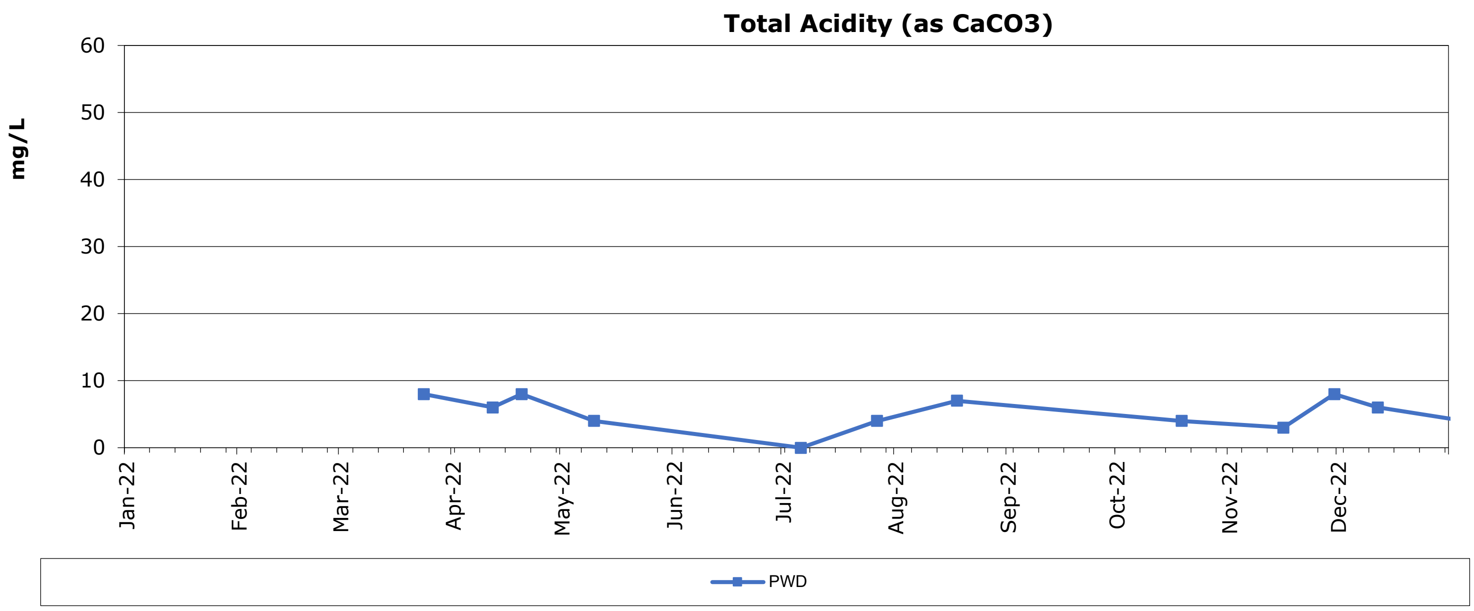

Chloride
mg/L
1000
900
800
700
600
500
400
300
200
100
0
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
PWP


Sulphate
mg/L
1000
900
800
700
600
500
400
300
200
100
0
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
PWP

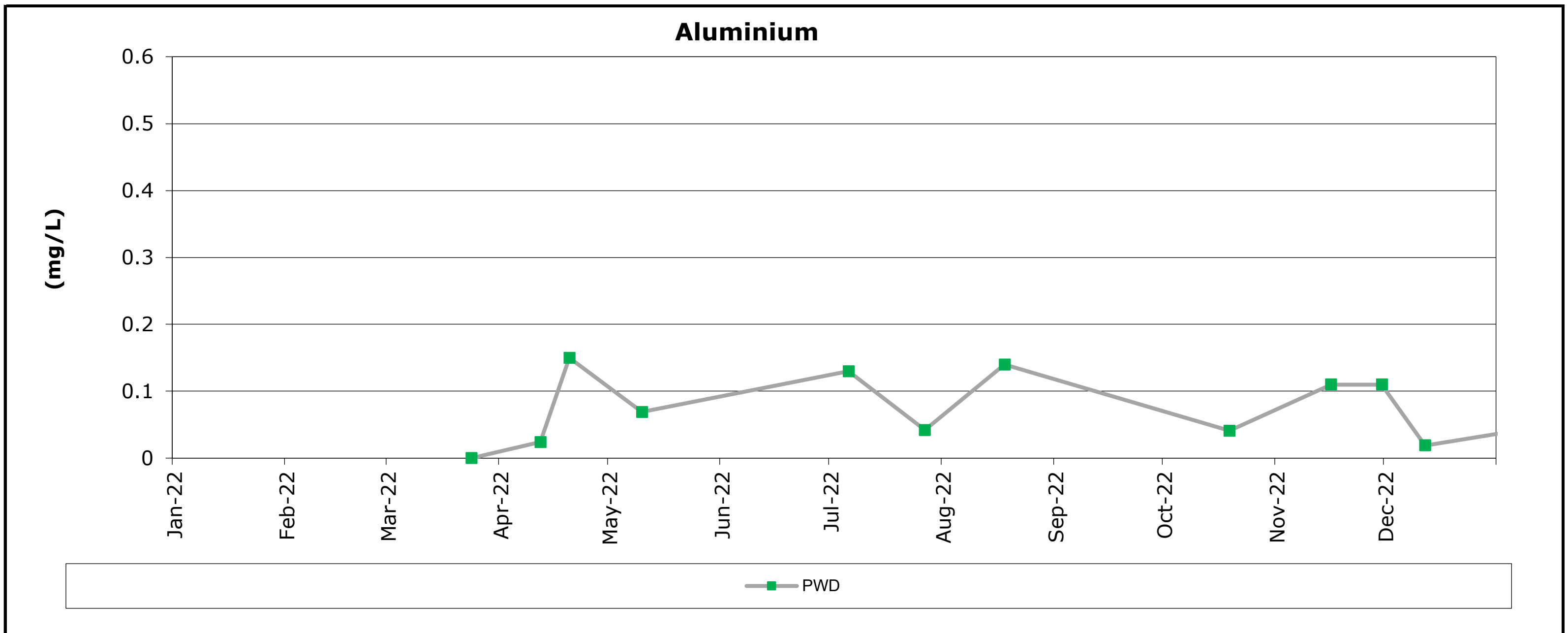

Sulphate: Chloride Ratio
SO4:Cl ratio
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
PWP

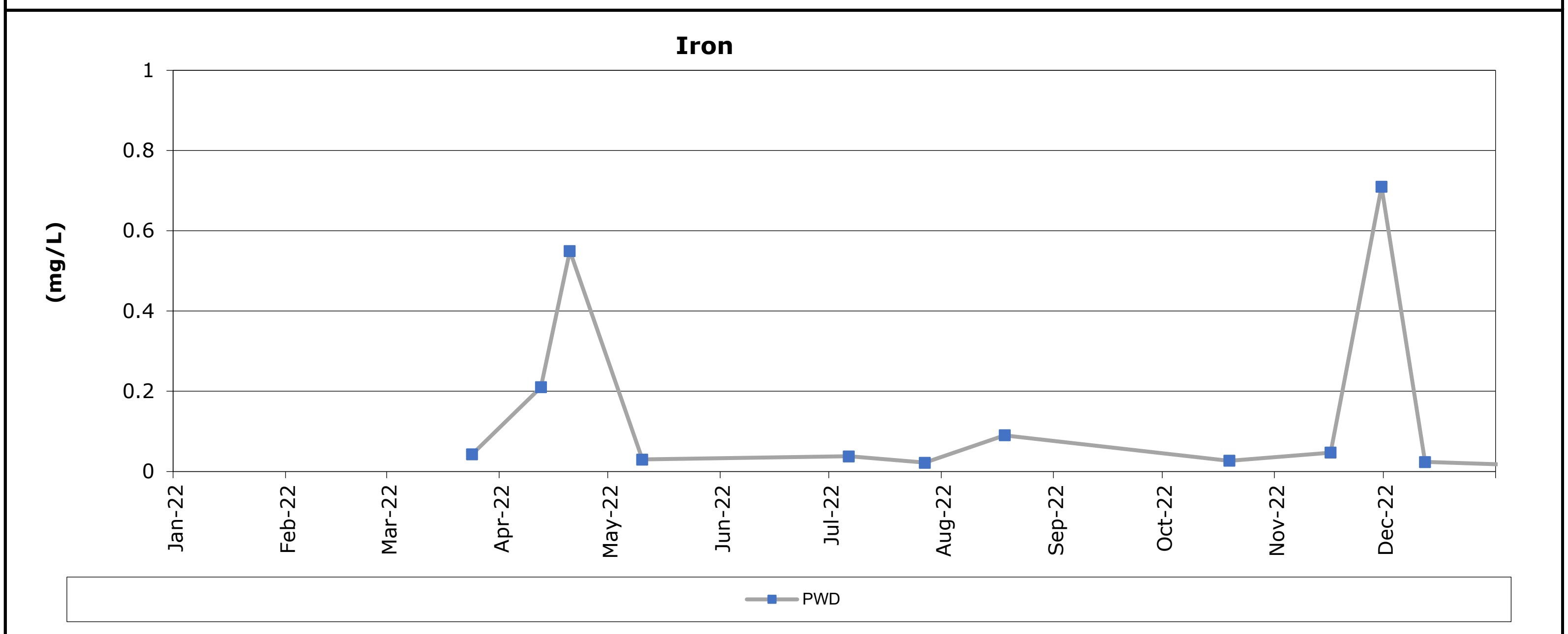


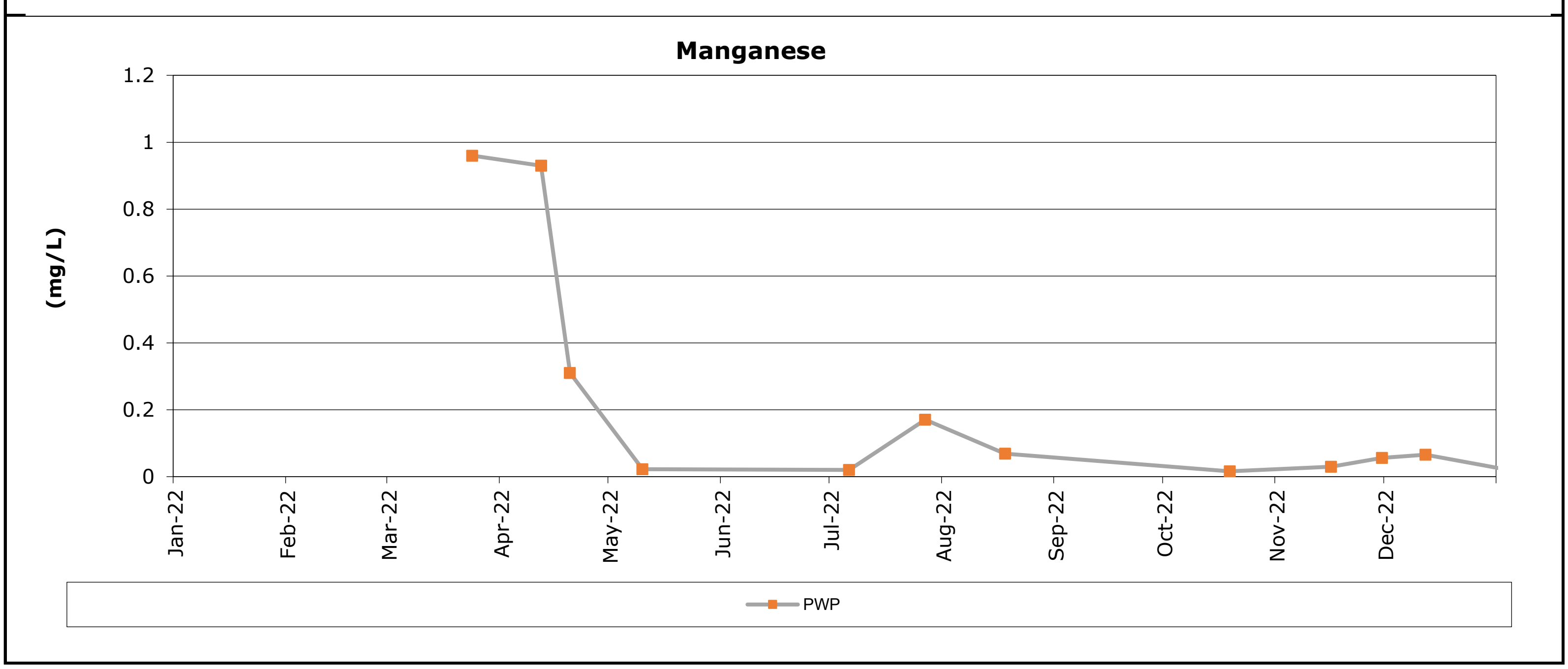
Total Alkalinity (as CaCO3)
mg/L
200
180
160
140
120
100
80
60
40
20
0
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
29 29



Total Acidity (as CaCO3)
mg/L
60
50
40
30
20
10
0
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
PWD

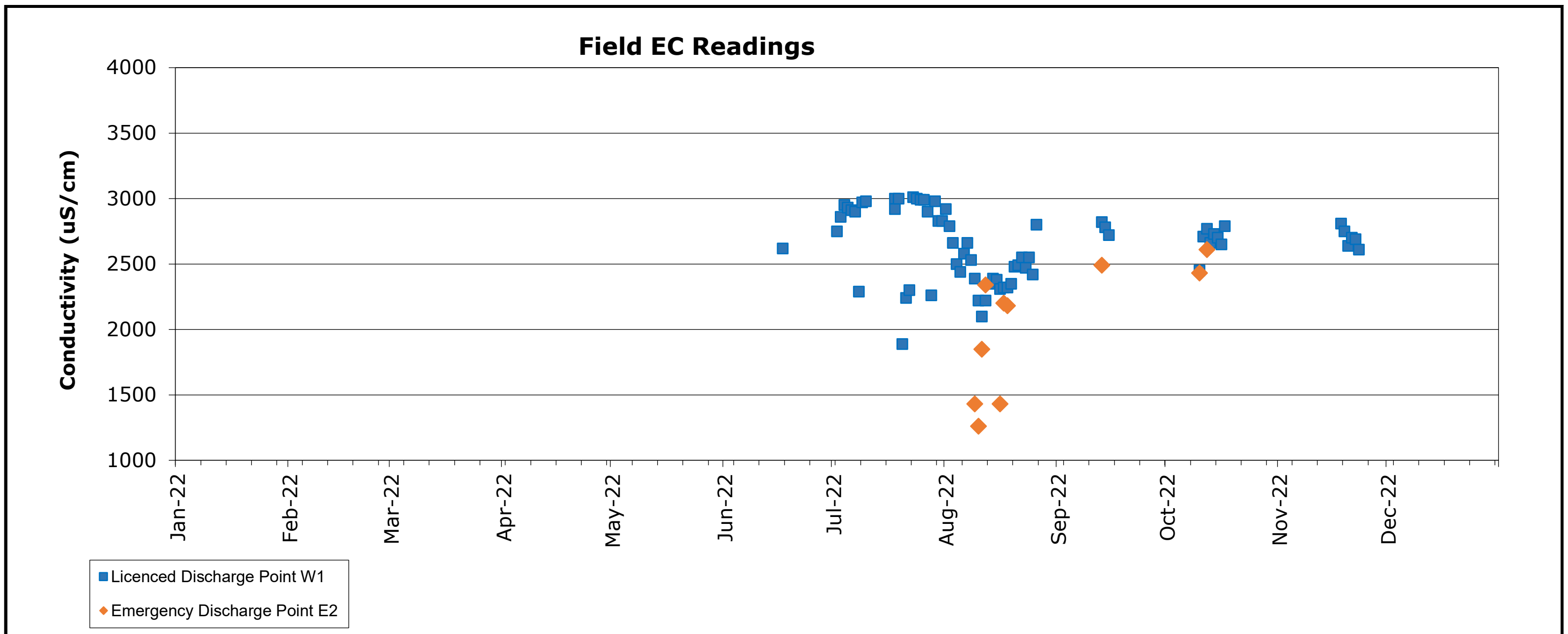


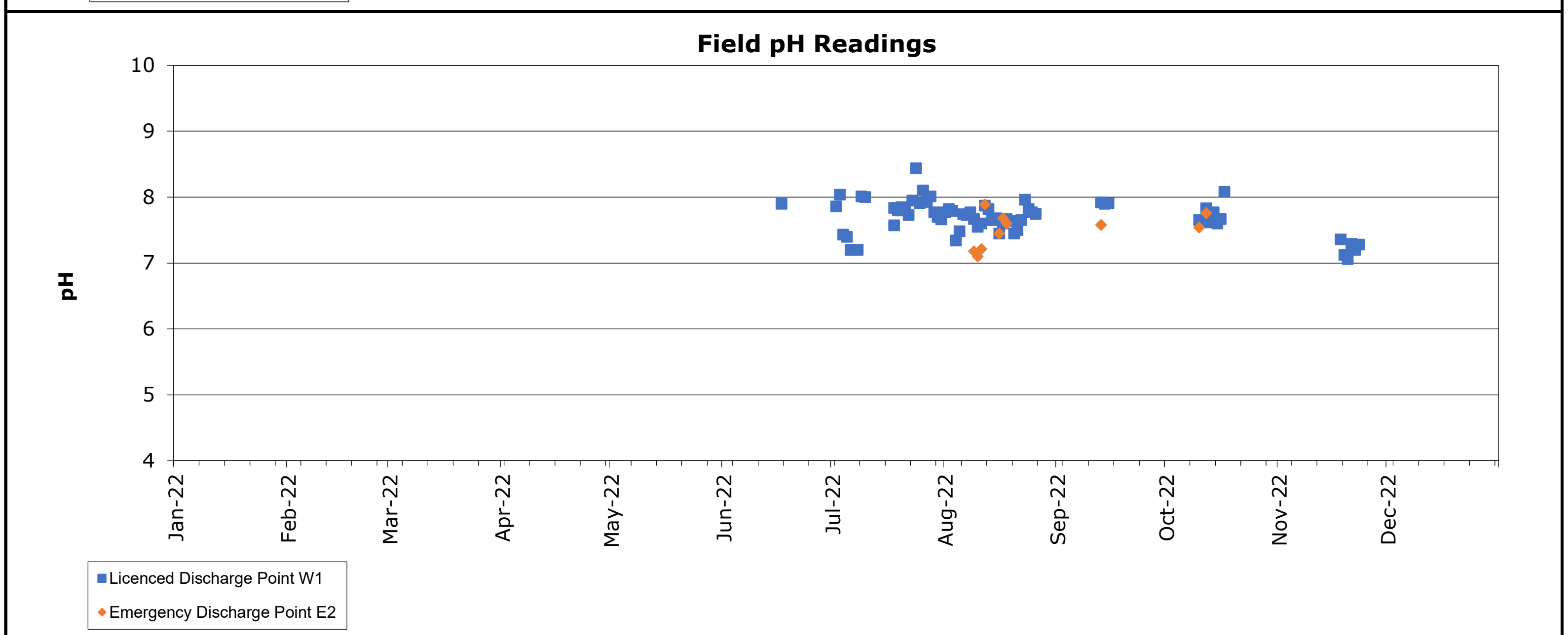


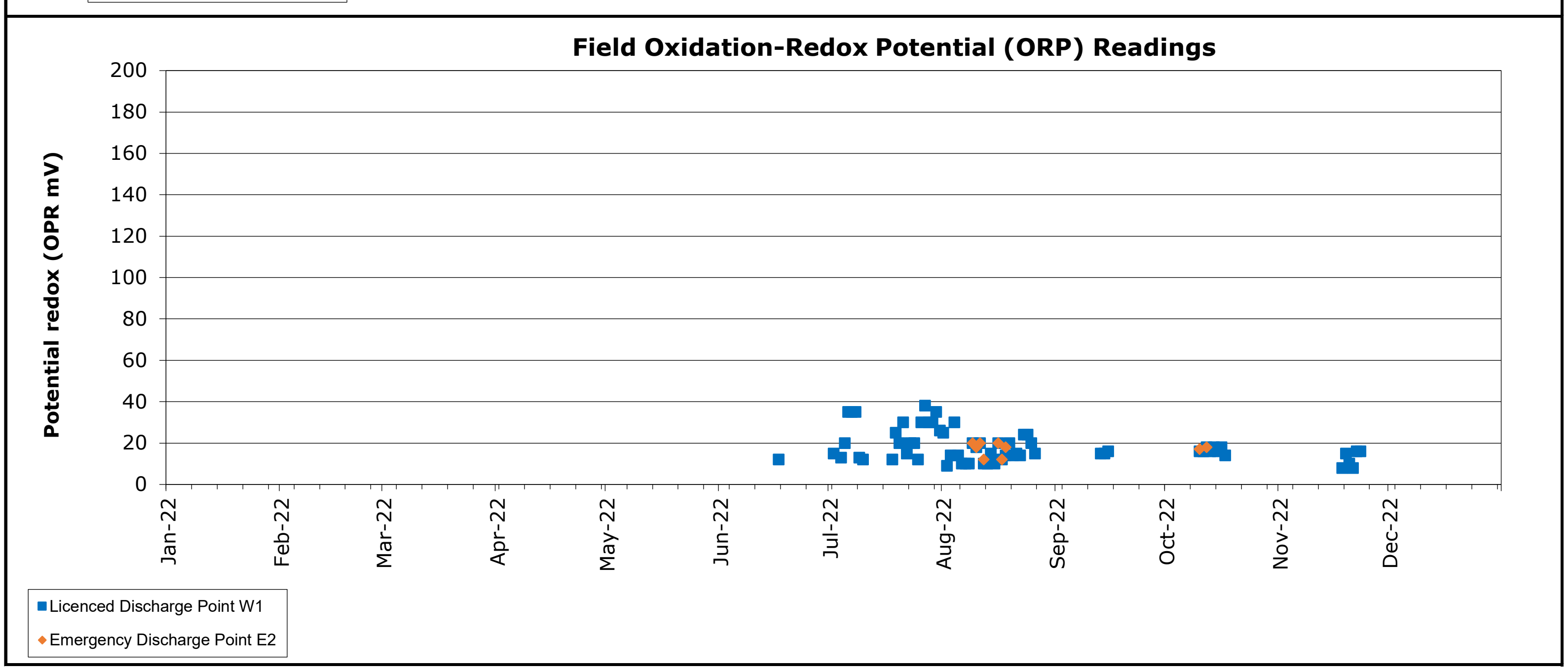


AQ2

PROCESS WATER POND (PWPD LABORATORY CHEMISTRY FIGURE 33d

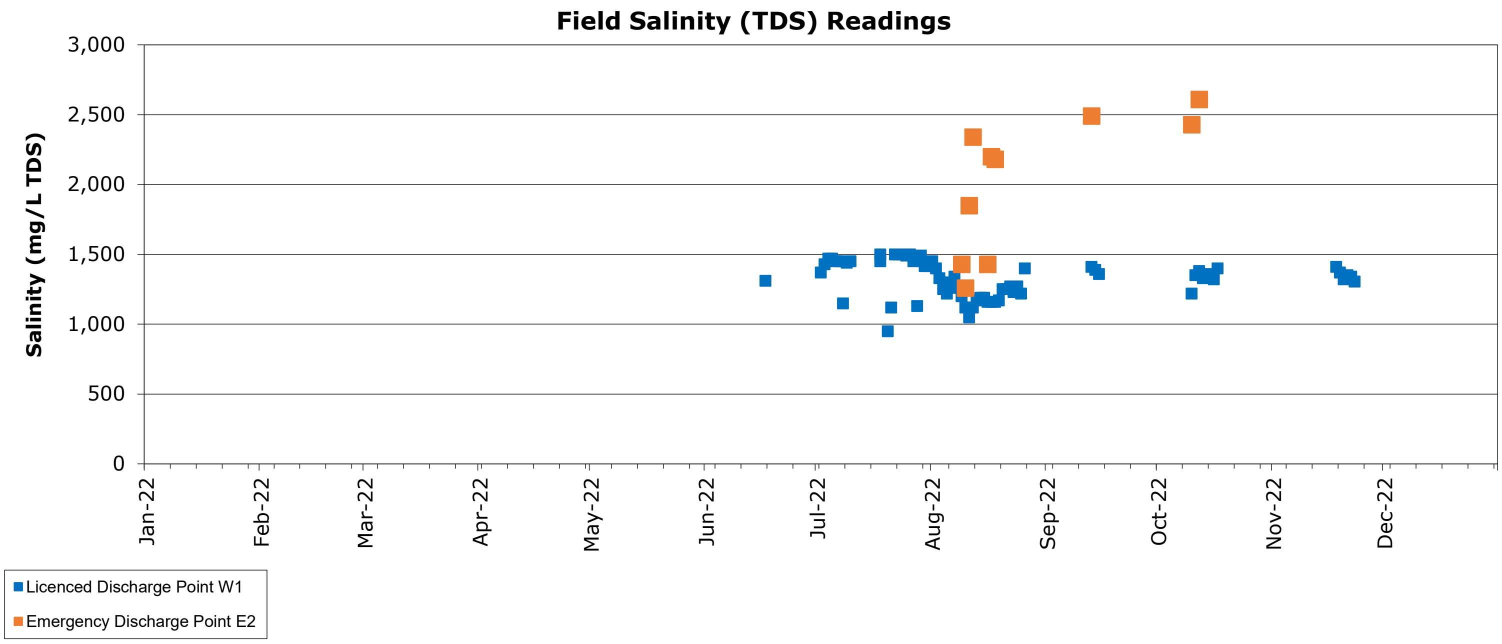


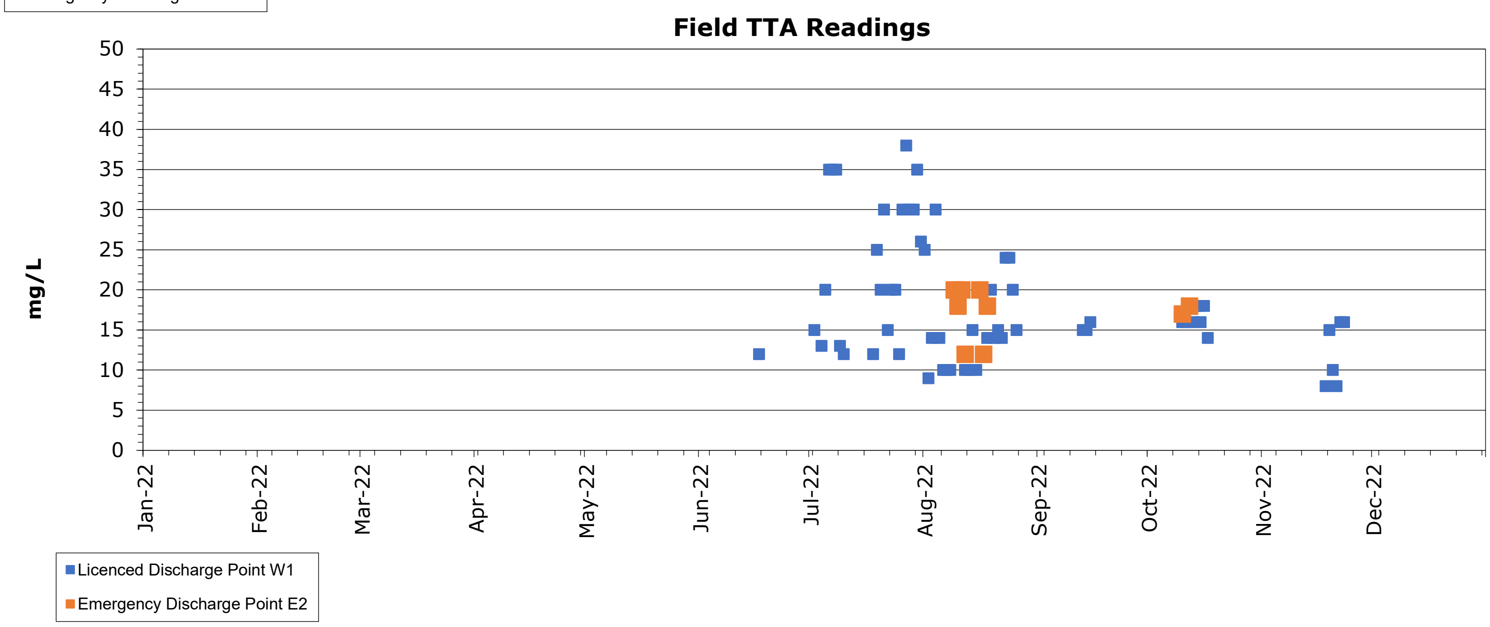


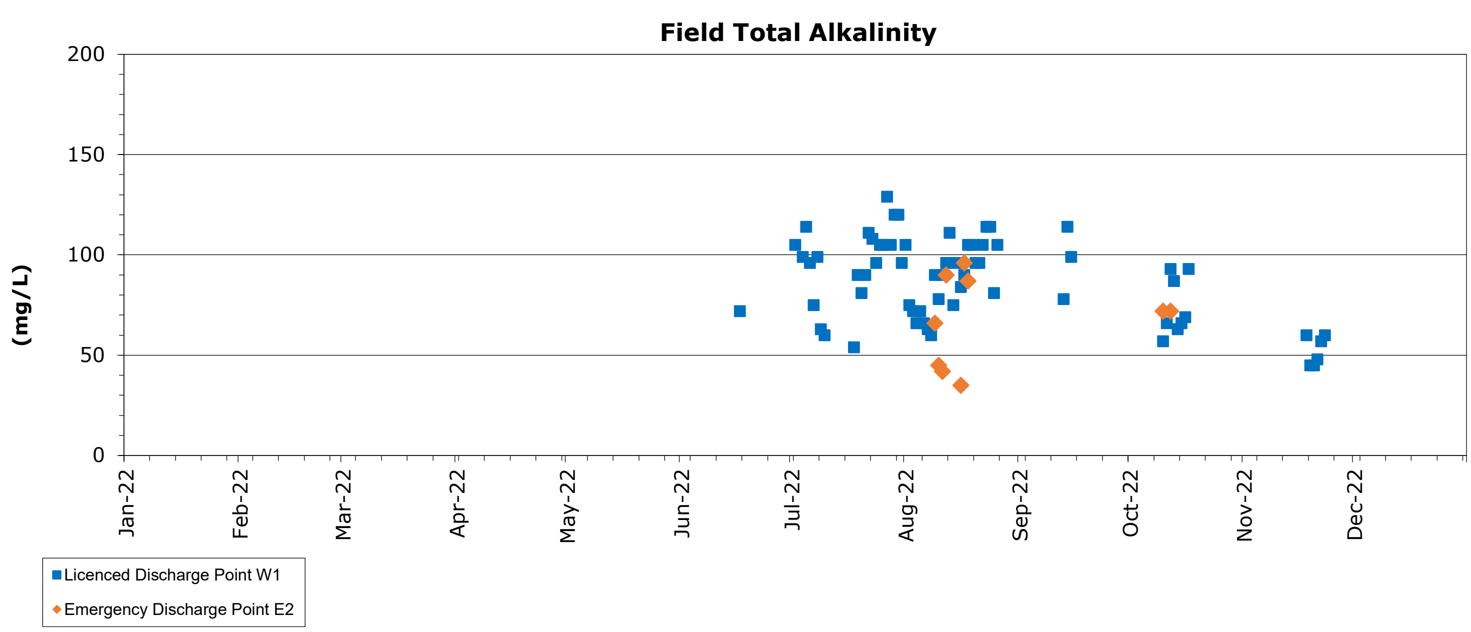


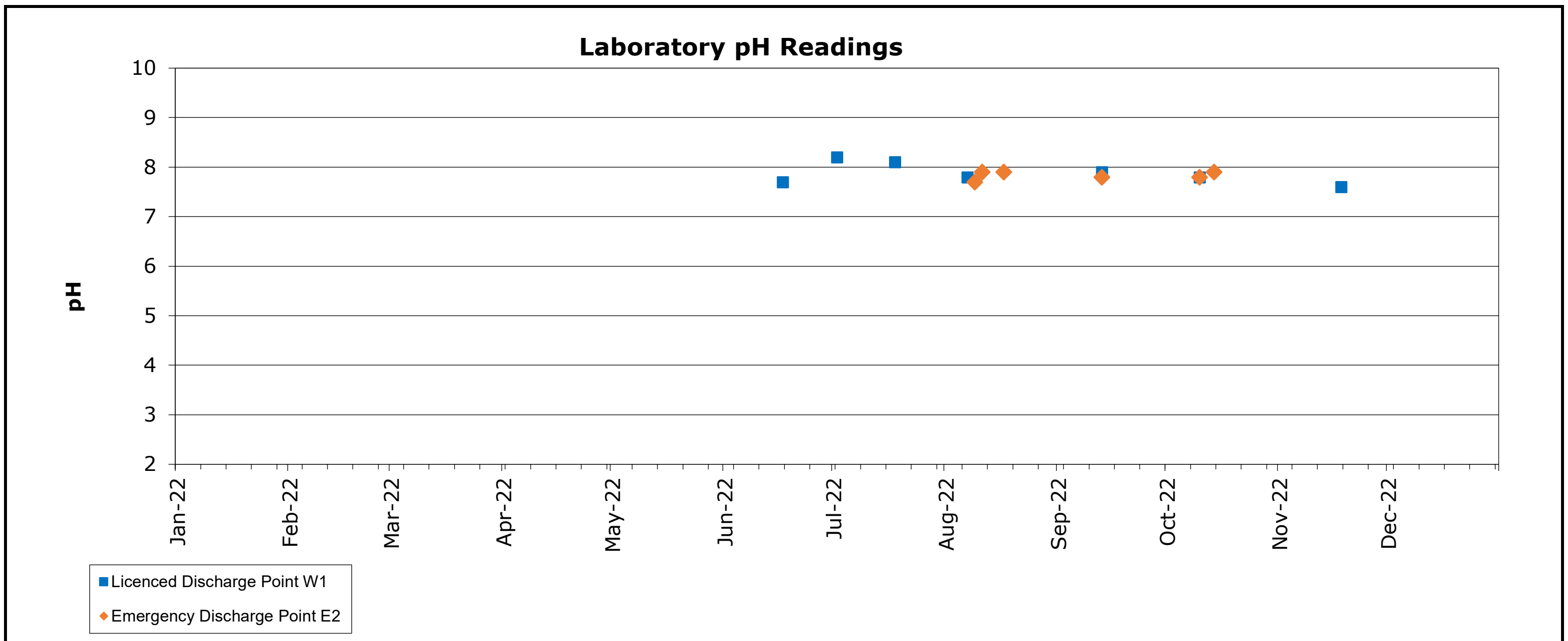
AQ2

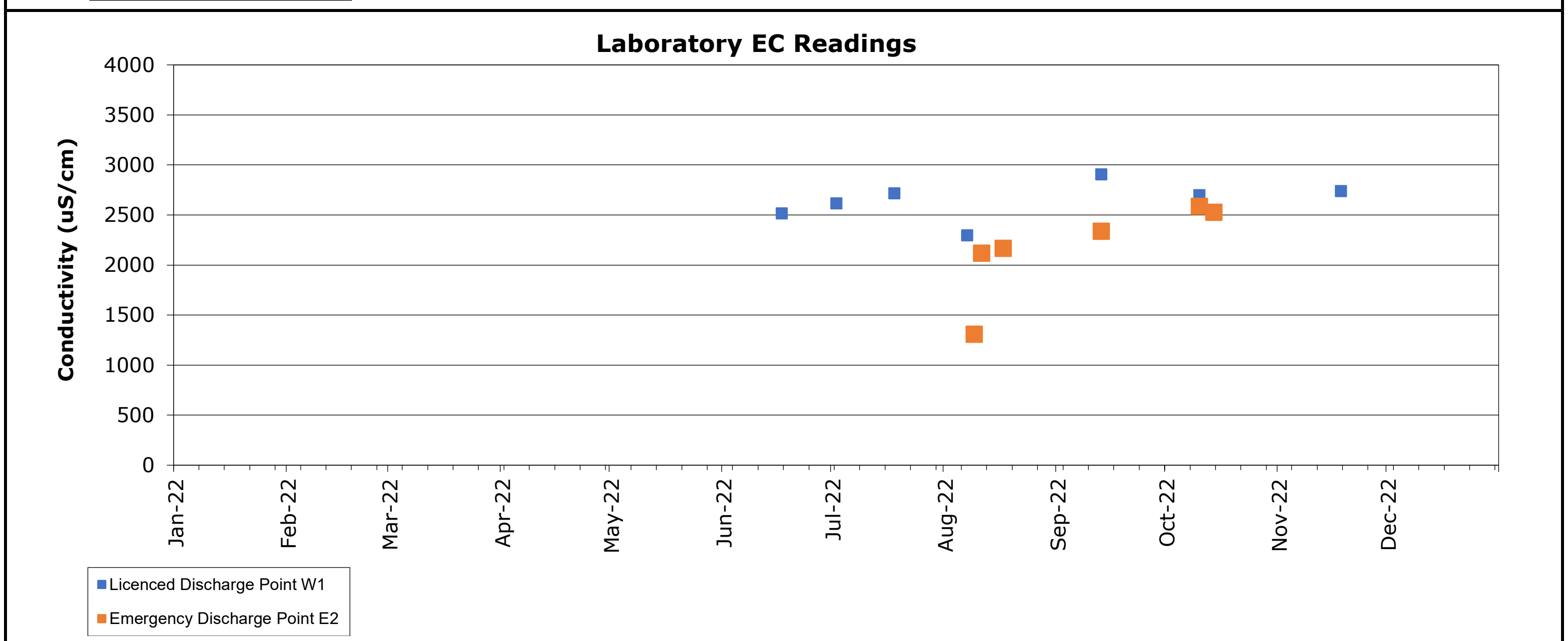
LICENCED DISCHARGE POINT W1 & EMERGENCY DISCHARGE POINT E2 FIELD CHEMISTRY FIGURE 34a

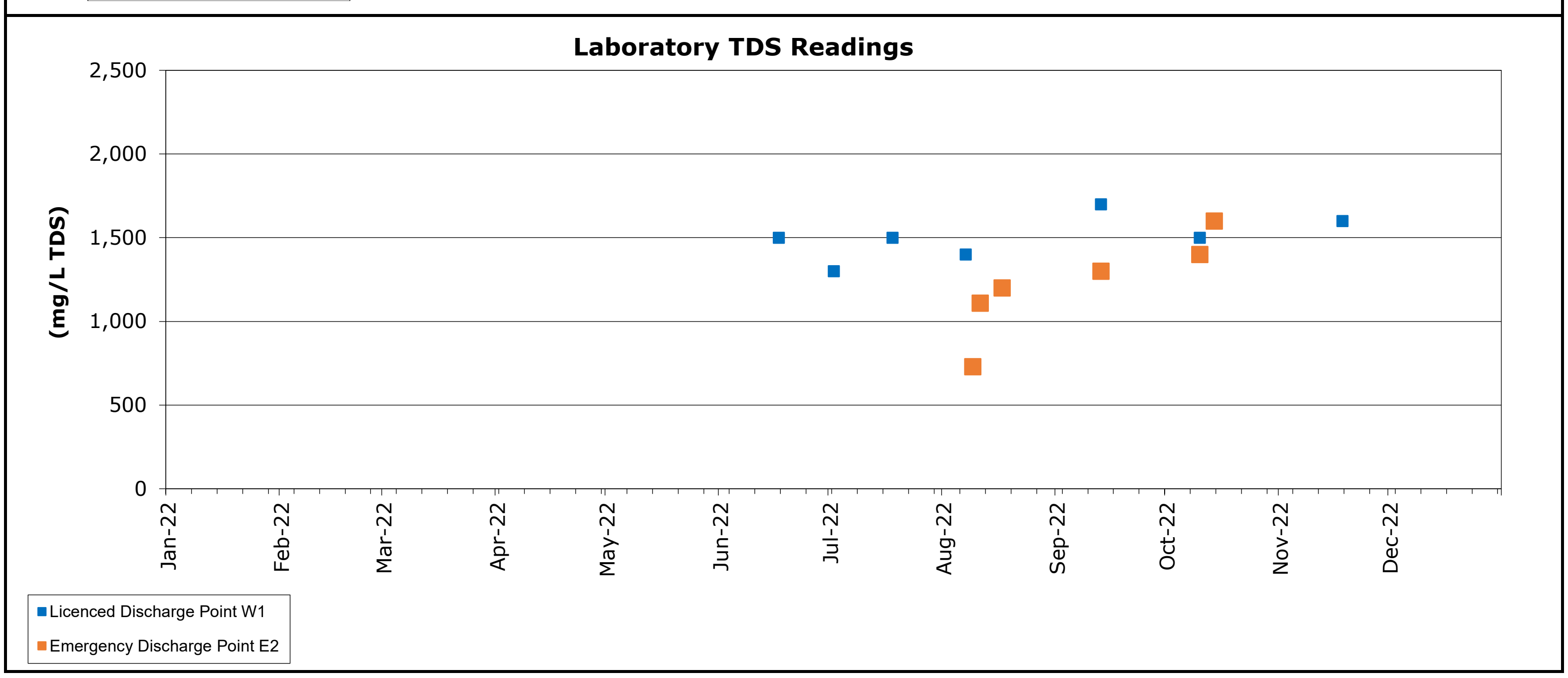

Field Salinity (TDS) Readings
Salinity (mg/L TDS)
3,000
2,500
2,000
1,500
1,000
500
0
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Licenced Discharge Point W1
Emergency Discharge Point E2


Field TTA Readings
mg/L
50
45
40
35
30
25
20
15
10
5
0
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Licenced Discharge Point W1
Emergency Discharge Point E2


Field Total Alkalinity
(mg/L)
200
150
100
50
0
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Licenced Discharge Point W1
Emergency Discharge Point E2

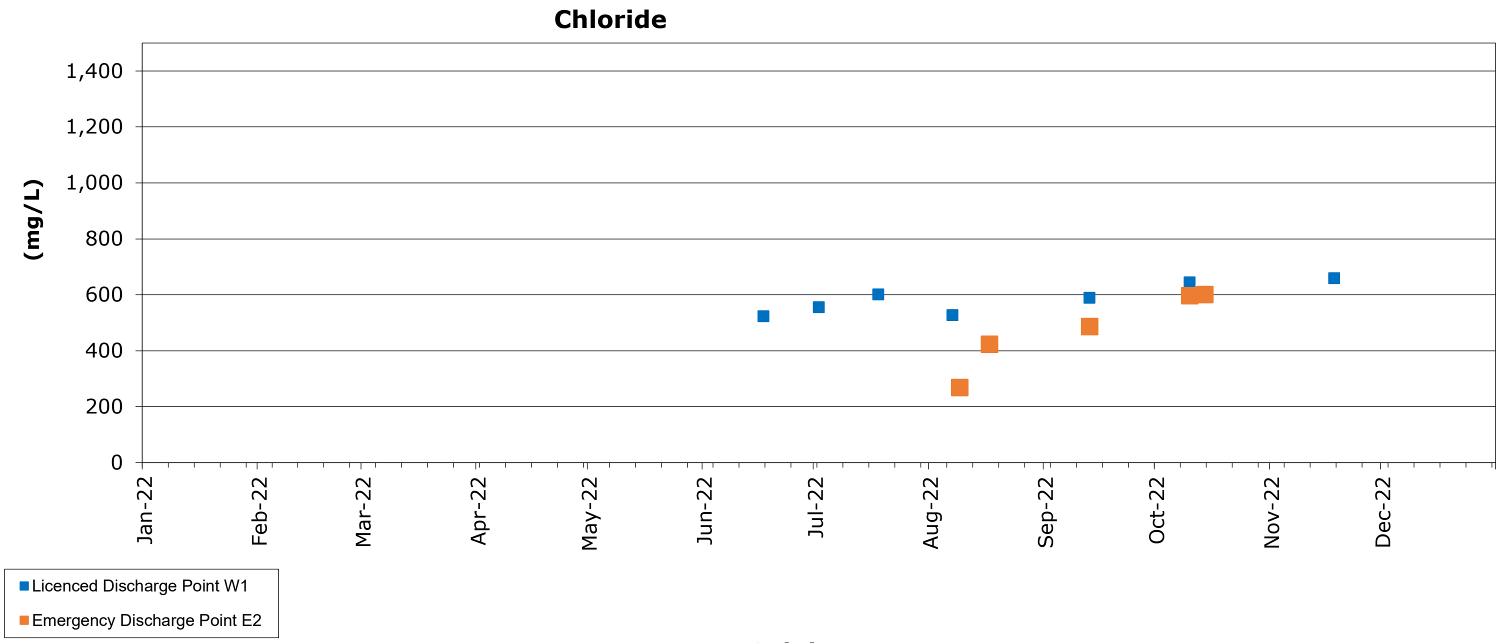


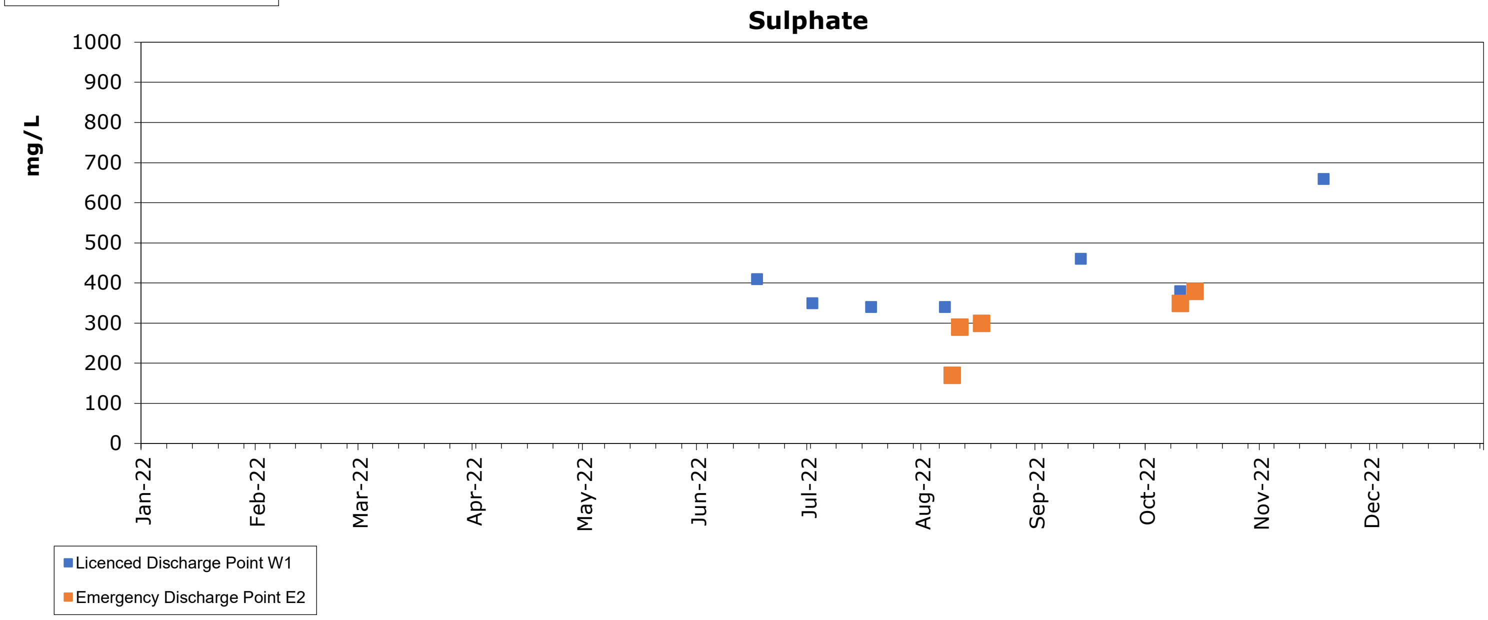


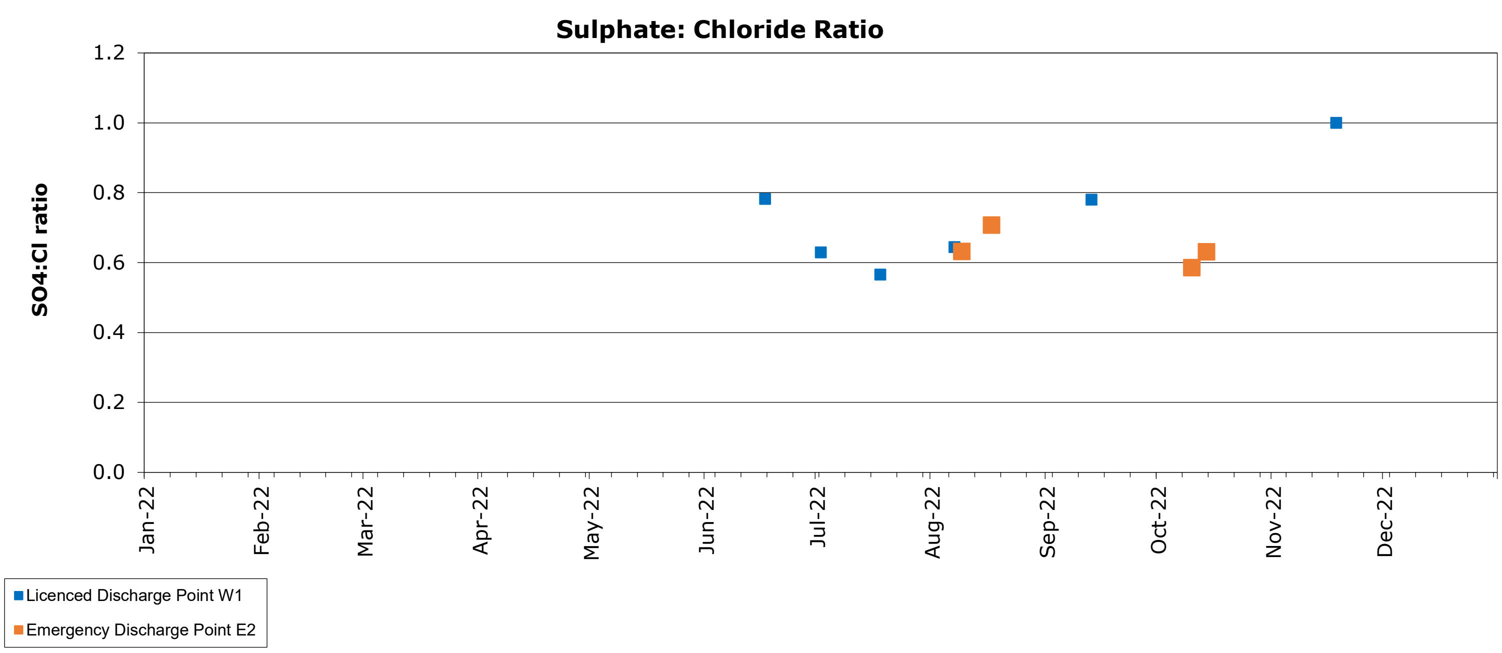


AQ2

LICENCED DISCHARGE POINT W1 & EMERGENCY DISCHARGE POINT E2
LABORATORY CHEMISTRY FIGURE 35a

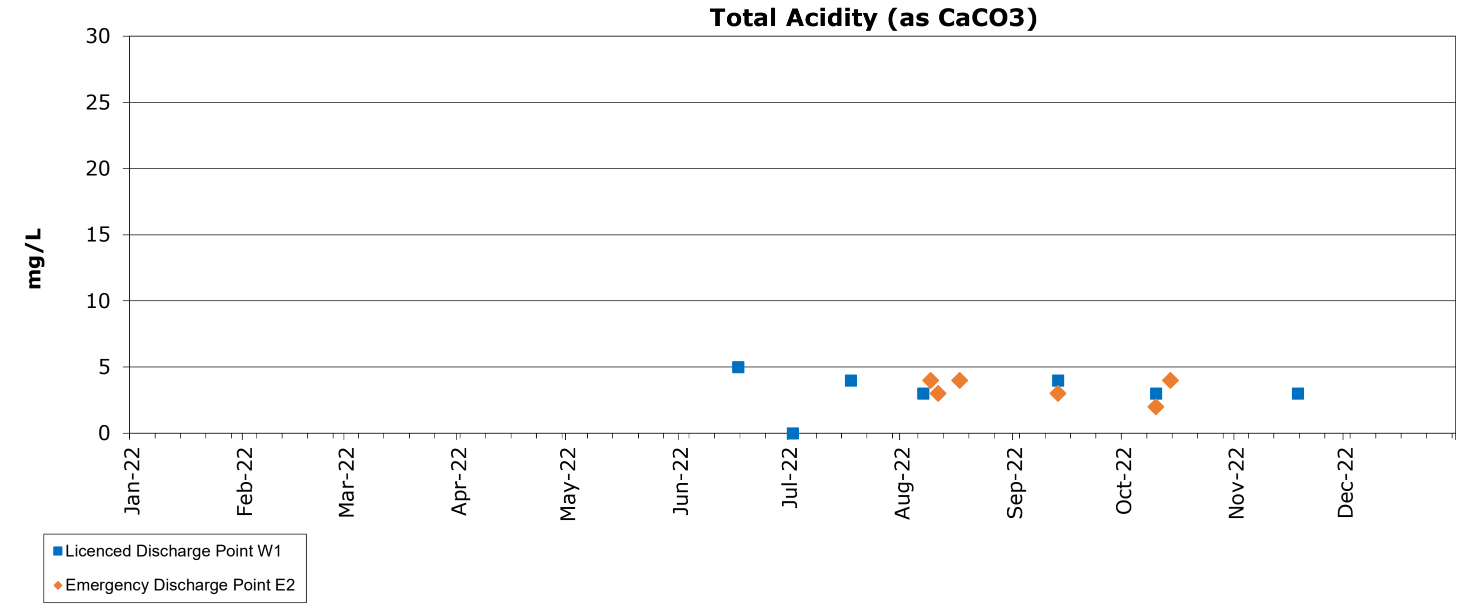


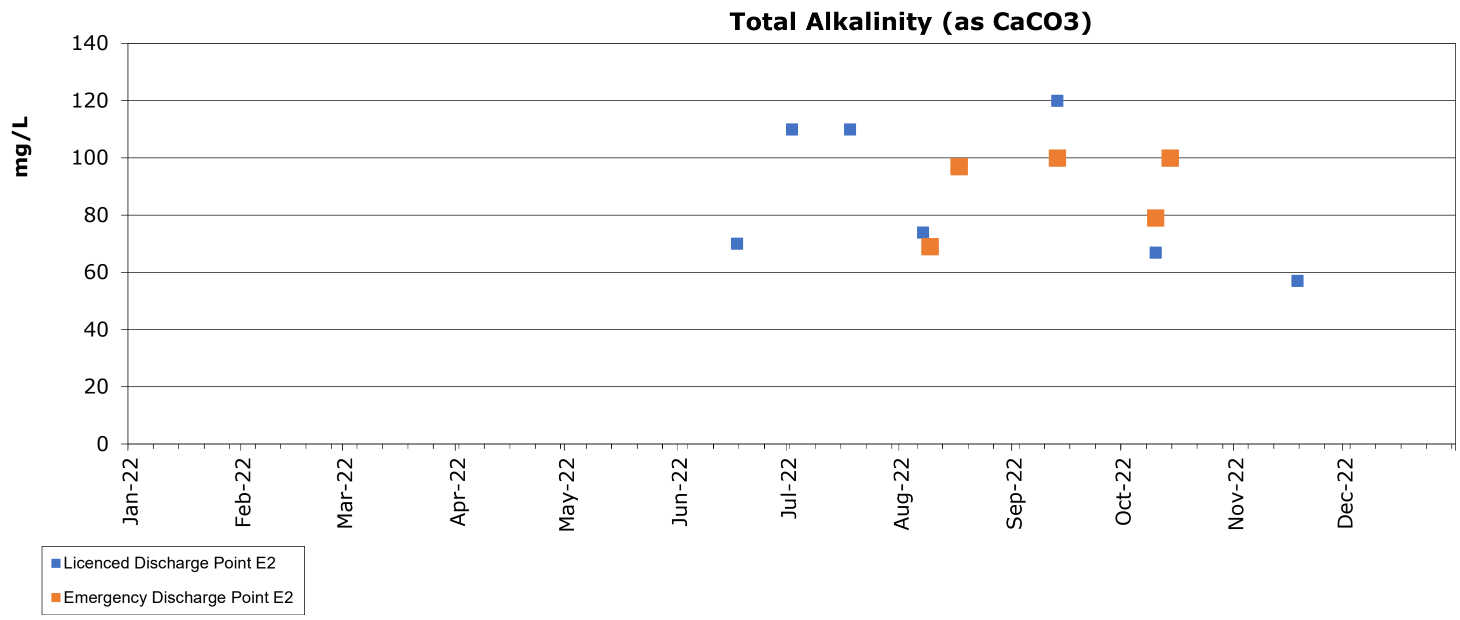


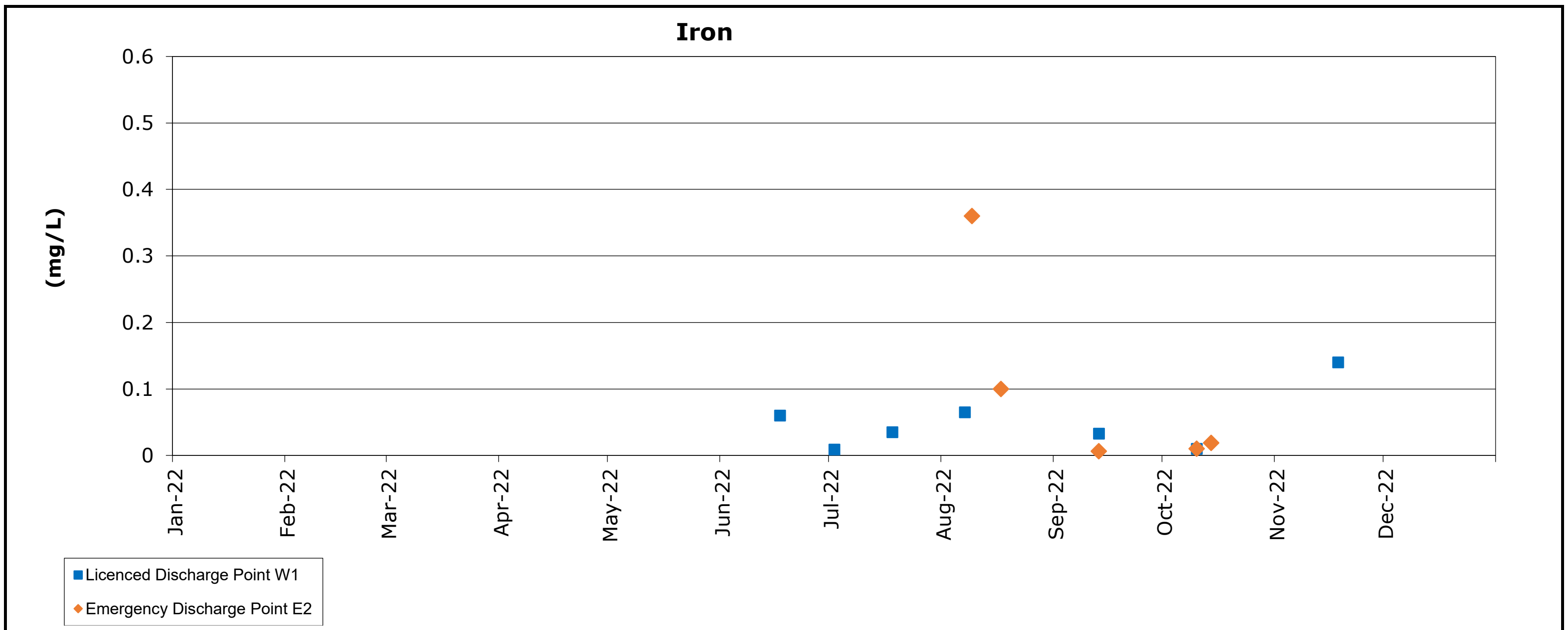


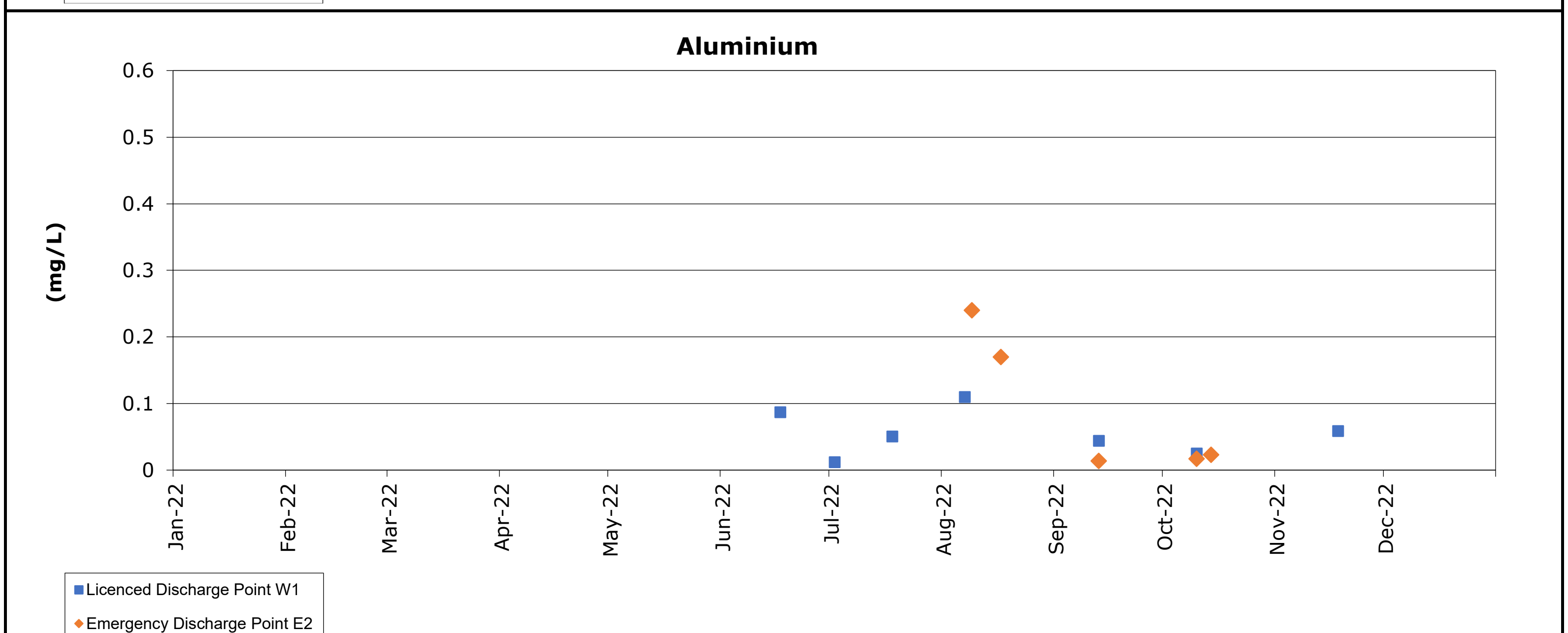
AQ2

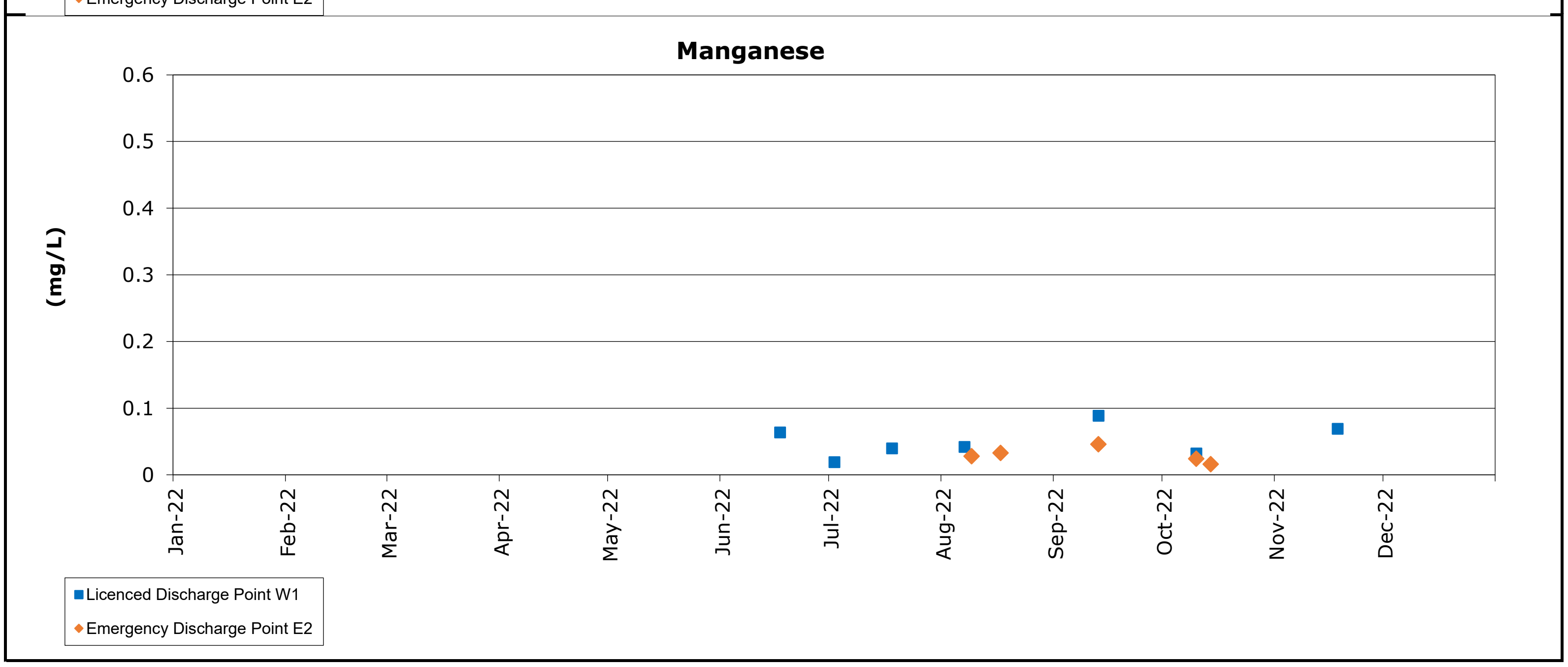
LICENCED DISCHARGE POINT W1 & EMERGENCY DISCHARGE POINT E2
LABORATORY CHEMISTRY FIGURE 35b


Total Acidity (as CaCO3)
mg/L
30
25
20
15
10
5
0
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Licenced Discharge Point W1
Emergency Discharge Point E2

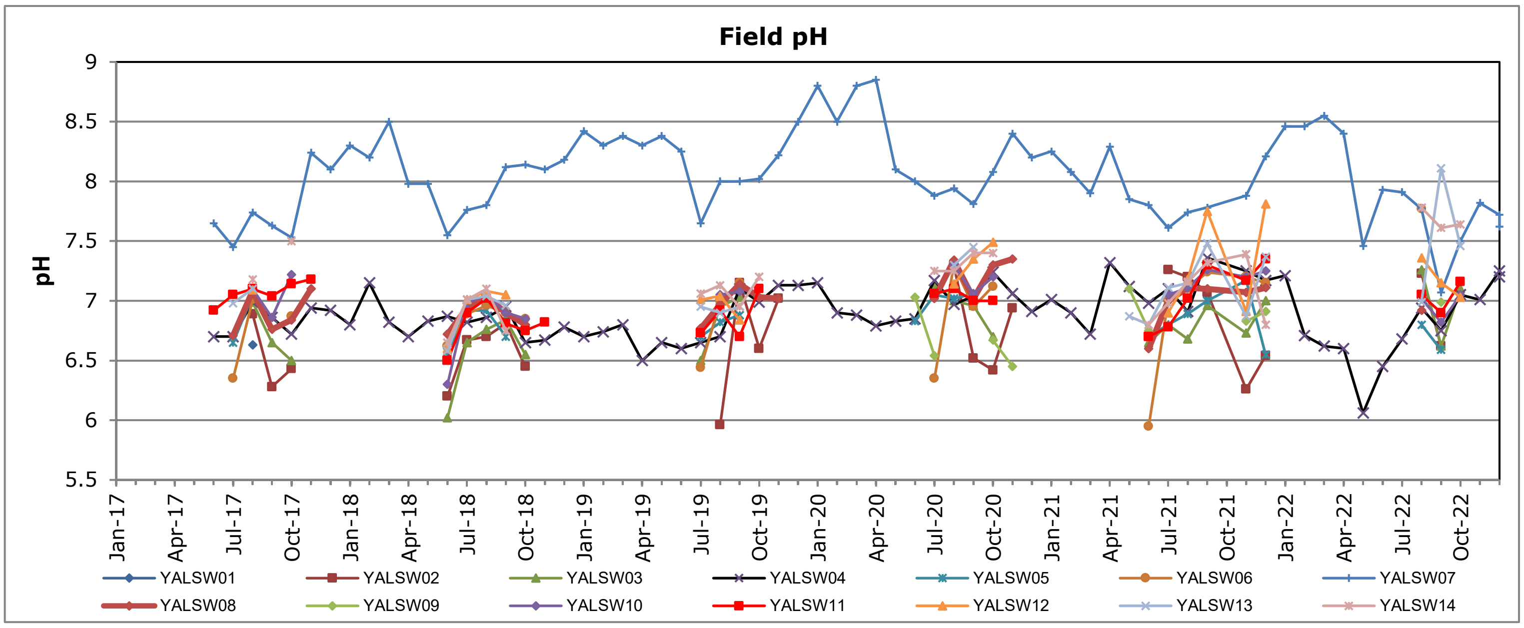

Total Alkalinity (as CaCO3)
mg/L
140
120
100
80
60
40
20
0
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Licenced Discharge Point E2
Emergency Discharge Point E2

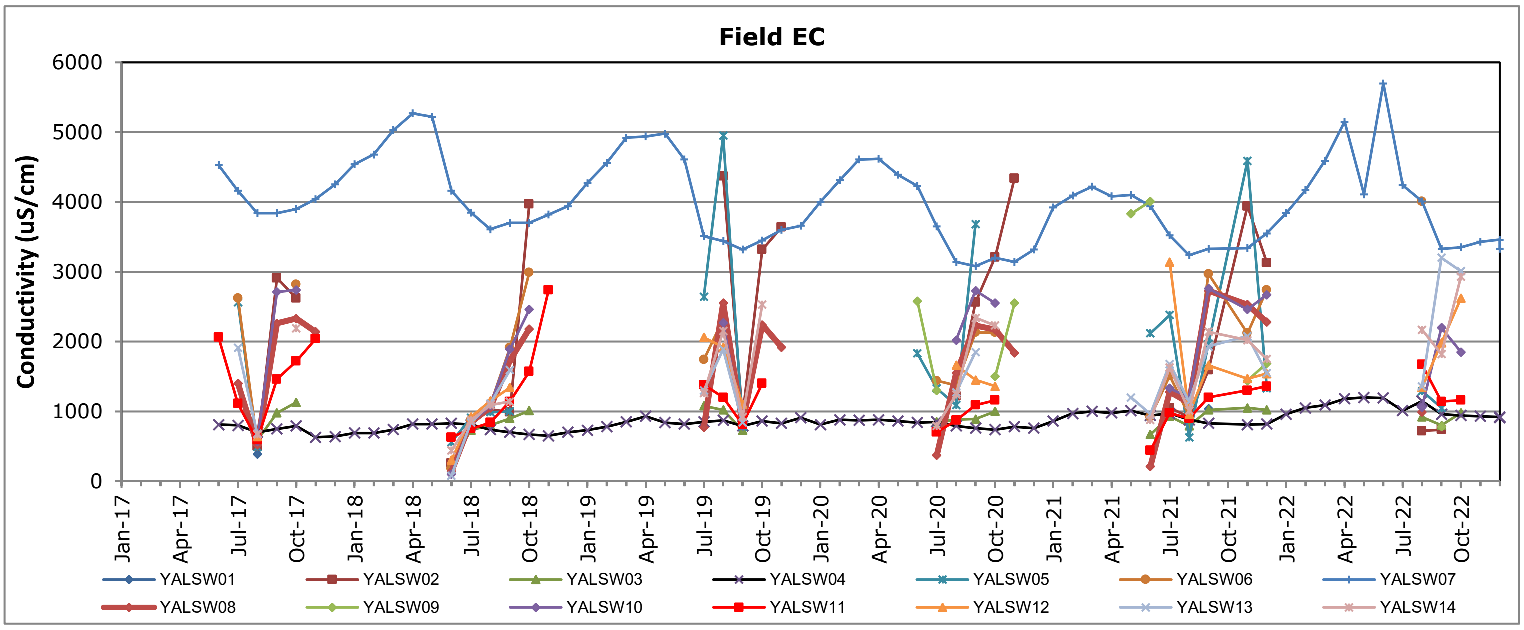


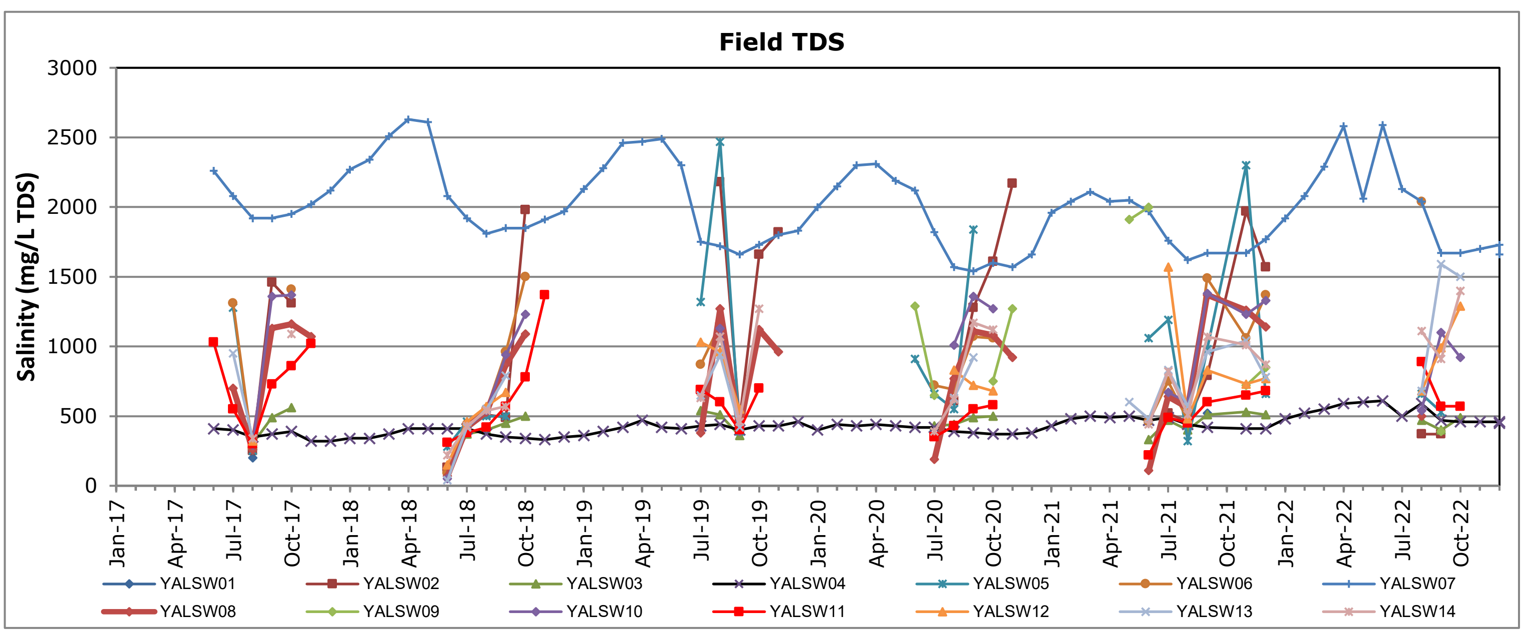




LICENCED DISCHARGE POINT W1 & EMERGENCY DISCHARGE POINT E2
LABORATORY CHEMISTRY FIGURE 35d

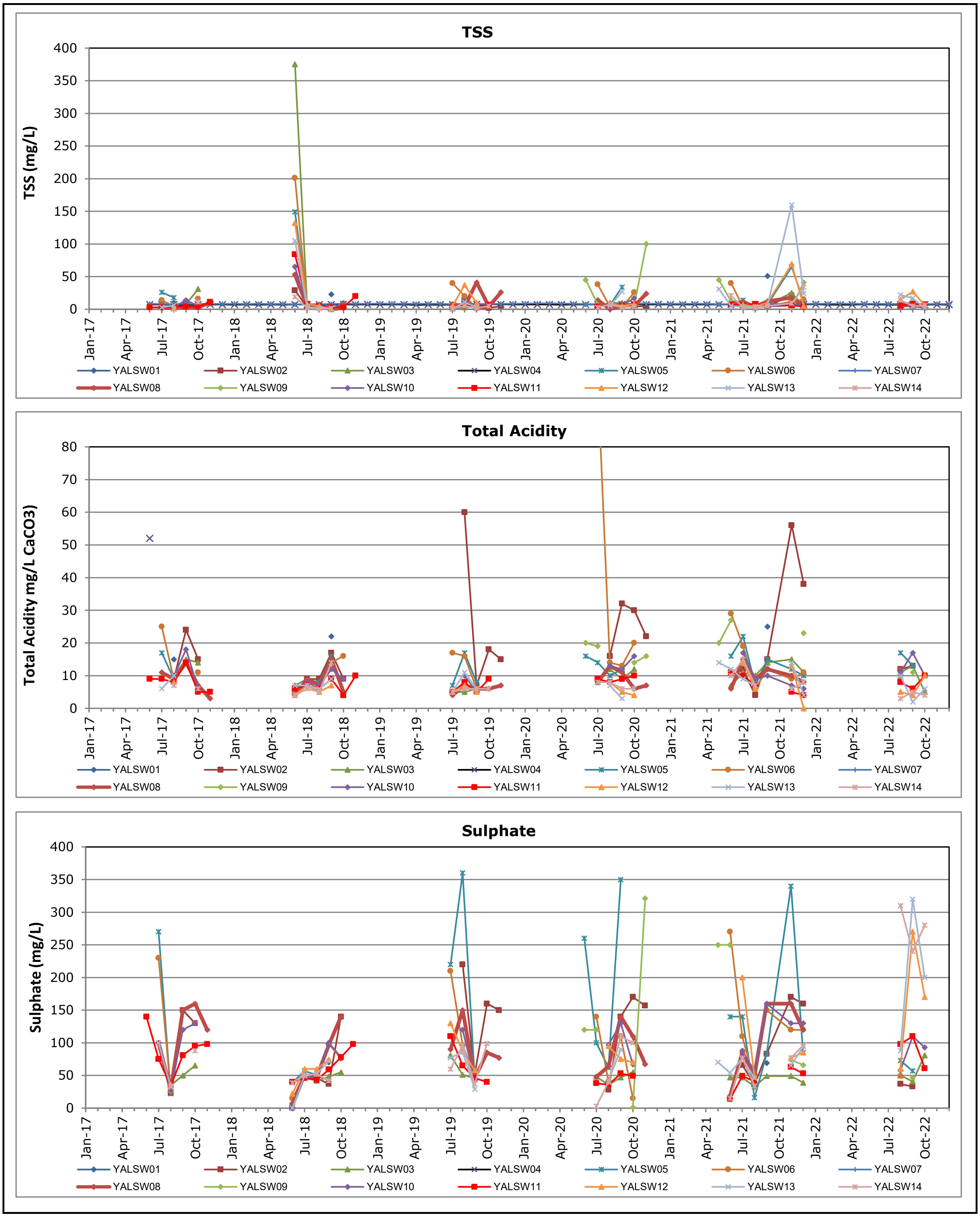






AQ2

Surface Water Sites YALSW01-YALSW14 Field Chemistry (pH, EC, TDS) FIGURE 36



Surface Water Sites YALSW01-YALSW14 Laboratory Chemistry (TSS, Total Acidity, Sulphate)
FIGURE 37

APPENDIX A
COPIES OF GROUNDWATER LICENCES

File No:
DWERT1212~1

Government of **Western Australia**
Department of **Water and Environmental Regulation**

Instrument No. GWL206603(1)

LICENCE TO TAKE WATER

Granted by the Minister under section 5C of the Rights in Water and Irrigation Act 1914

Licensee(s)	Doral Mineral Sands Pty Ltd		
Description of Water Resource	Busselton-Capel Perth - Superficial Swan	**Annual Water Entitlement**	750,000kL
Location of Water Source	M70/1400		

Authorised Activities	**Taking of water for**	**Location of Activity**
	Dewatering for mining purposes	M70/1400
Duration of Licence	From 14 November 2021 to 30 December 2030	

This Licence is subject to the following terms, conditions and restrictions:

1. That the draw from the well/s be limited to the superficial formation.

2. The annual water year for water taken under this licence is defined as 1 January to 31 December.

3. The licensee must not, in any water year, take more water than the annual water entitlement specified in this licence.

4. Every 12 Months the licensee shall provide to the Department of Water and Environmental Regulation a Groundwater Monitoring Summary for the preceding water year. The first report is due 31/03/2022.

5. The volume of all water taken under this licence must be metered using an approved meter fitted to each drawpoint.

6. The licensee must take and record the reading from each meter required under this licence, at the end of each month.

7. All monitoring and reporting shall be carried out in accordance with Operational Policy 5.12 'Hydrogeological reporting associated with a groundwater well licence'.

8. Should the monitoring at any time indicate a need for prompt action to prevent or reduce the effect of the licensee's draw on the underground resource, the licensee shall immediately report this to the Department of Water and Environmental Regulation and advise the corrective measures proposed.

9. The licensee shall comply with the monitoring program as prepared by the licensee and approved by the Department of Water and Environmental Regulation on 12/11/2021, including any modifications to the program as approved during the term of the licence.

10. The licensee shall comply with the commitments of the operating strategy for Doral Mineral Sands Pty Ltd, Yalyalup Mineral Sands Project, as prepared by Doral Mineral Sands and approved by the Department of Water and Environmental Regulation on 12/11/2021 including any modifications to the commitments as approved during the term of the licence.

11. The Licensee is to provide an updated Water Monitoring table as Attachment 1 of the Groundwater Operating Strategy, to the Department of Water and Environmental Regulation by 30 November 2021. The Monitoring Program can be updated during the term of the licence with approval by the Department of Water and Environmental Regulation.

End of terms, conditions and restrictions

This Licence is granted subject to the Rights in Water and Irrigation Regulations 2000.

LICENCE TO TAKE WATER

Granted by the Minister under section 5C of the Rights in Water and Irrigation Act 1914

Licensee(s)	Doral Mineral Sands Pty Ltd		
Description of Water Resource	Busselton-Capel Perth - Yarragadee South.	**Annual Water Entitlement**	394,000kL
Location of Water Source	L70/214 M70/459		

Authorised Activities	**Taking of water for**	**Location of Activity**
	Domestic use	M70/1400
	Dust Suppression for mining purposes	L70/214 M70/1400
	Mineral ore processing and other mining purposes	L70/214 M70/1400
	Rehabilitation purposes	L70/214 M70/1400 M70/459
Duration of Licence	From 3 December 2021 to 19 March 2029	

This Licence is subject to the following terms, conditions and restrictions:

1. The licensee is to comply with the commitments of the Operating Strategy for Doral Mineral Sands Pty Ltd - Yalyalup Mineral Sands Project, as prepared by Doral Mineral Sands Pty Ltd and approved by the Department of Water and Environmental Regulation in December 2021 and any amendments made by or with the approval of the Department.

2. The water year is defined as a specified 12 month period for the purposes of groundwater management planning, annual water accounting and annual reporting.

3. The licensee must not, in any water year, take more water than the annual water entitlement specified in this licence.

4. The licensee must install an approved meter on each water draw-point through which water is taken under this licence.

5. The licensee must maintain the meter in good condition and ensure that it is operating within a range of plus or minus 5% of the quantity of water that passes through it when tested in field conditions.

6. The licensee must notify the Department within 7 days of detecting a malfunction of the meter.

7. The licensee must obtain authorisation from the Department of Water and Environmental Regulation before removing, replacing or interfering with any meter required under this licence.

8. Every 12 Months the licensee shall provide to the Department of Water and Environmental Regulation a Groundwater Monitoring Summary for the preceding water year. The first report is due 31/03/2022.

9. Every 3 Years the licensee shall provide to the Department of Water and Environmental Regulation a Groundwater Monitoring Review. The first report is due 31/03/2024. A Groundwater Monitoring Summary need not be submitted in a year in which a Groundwater Monitoring Review is due.

This Licence is granted subject to the Rights in Water and Irrigation Regulations 2000.

LICENCE TO TAKE WATER

Granted by the Minister under section 5C of the Rights in Water and Irrigation Act 1914

This Licence is subject to the following terms, conditions and restrictions:

10. All monitoring and reporting shall be carried out in accordance with Operational Policy 5.12 'Hydrogeological reporting associated with a groundwater well licence'.

11. The annual water year for water taken under this licence is defined as 1 January to 31 December.

12. The licensee is to provide a water monitoring summary for the Yoongarillup project as detailed in the addendum to the Yoongarillup Operating Strategy dated March 2021, to the Department of Water and Environmental Regulation by 31 March each year, the licencee is to comply with the monitoring program and any changes made by or with the approval of the department.

End of terms, conditions and restrictions

APPENDIX B
COPY OF GROUNDWATER OPERATING STRATEGY

FINAL

GROUNDWATER LICENCE OPERATING STRATEGY FOR THE DORAL MINERALS SANDS PTY LTD, YALYALUP MINERAL SANDS PROJECT

November 2021

AQ2 Pty Ltd
Level 4, 56 William Street
Perth 6000

T: 08 9322 9733
www.aq2.com.au

Name of water licence applicant/licensee: Doral Mineral Sands Pty Ltd

Name of development project or purpose: Yalyalup Mineral Sands Project

Legal description and address of land where is to be taken, and used:

M70/1400, L70/214

Declaration:

"I understand that the commitments given in the attached operating strategy will be a condition of an associated water licence if approved and that non-compliance with a commitment or any licence condition may be a breach of the Rights in Water and Irrigation Act 1914".

Signatures:
Person legally responsible for water licence:

………
Printed Name:

……………………………………………………………………………………………………Date………………………………

Document Status

Version #	Issue Date	Author	Reviewer	Change Made
023a	04/05/2020	BDK	JLJ	New draft document
023b	13/05/2020	BDK	JLJ/CB	Revised Draft
023c	11/01/2021	BDK	AGH	Updated Draft
023d	30/06/2021	BDK	JE	Updated Draft
023e	23/09/2021	BDK	JE/CB	Final
023f	30/11/2021	BDK	JE	Updated Final

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Figures

Appendices

1 Introduction

Doral Mineral Sands Pty Ltd (Doral) proposes to develop the Yalyalup mineral sands mine, located approximately 11 km south-east of Busselton, Western Australia (Figure 1). The Yalyalup mineral sands deposit is located within Mining Lease M70/1400 and Miscellaneous Lease L70/214, which covers an area of approximately 2,290 hectares, halfway between Iluka's Tutunup South Mine (closed in 2018) and Tronox's Wonnerup Mine (operating and northern extension).

The expected Yalyalup mine life is scheduled for six years, with three and a half years of the mining phase and the remainder being startup and closure. To enable optimal resource recovery, the mining will occur below the groundwater level and as a result, dewatering of the open-cut pits will be required to provide dry mining conditions. Superficial aquifer dewatering flows are expected to vary across the project duration, depending on the mining plan and schedule.

Water supplies are required for mineral ore processing and are planned to be sourced from recycled water from hydraulically returned tailings (i.e. sand and clay fines pumped to the mine void and solar evaporation ponds), rainfall runoff, pit dewatering water and supplemented by pumping from the external production bore in the Yarragadee aquifer (only during periods of water shortfall).

Doral prepared a draft Environmental Review Document (ERD), submitted to the Department of Water and Environmental Regulation (DWER) on 6th December 2019. The DWER and other relevant government agencies have recently reviewed Doral's draft ERD. The DWER have provided comments and actions that are to be addressed in the revised draft ERD (DWER letter received on 30th March 2020, DWER ref: DWERA-000551). Some of the DWER comments relate to the provision of management plans that describe the specific management, monitoring, trigger thresholds and contingencies for environmental factors, that will support the assessment of Doral's ERD. One of the management plans is the Groundwater Licence Operating Strategy (GWOS) that is usually required to support a 5C Groundwater Licence (GWL) application to abstract groundwater. A draft GWOS was prepared (AQ2, 2021) to support the ERD assessment, in light of the potential predicted impacts and adequacy of the proposed management measures.

This final GWOS has been prepared in accordance with the DWER operational policy 5.08 for reporting associated with operating strategies (DWER, 2020) and the DWER guidelines for the preparation of Operating Strategies for mineral sand mine dewatering licences in the South West Region (DWER, 2015). The GWOS covers groundwater extracted from both the Superficial aquifer (during mine dewatering) and the Yarragadee aquifer (for water supply). Additionally, monitoring of surface water monitoring sites is covered in this GWOS.

It should be noted that this final GWOS presents all commitments stated in the draft version, with minor updates (i.e. the details of new Yarragadee production bore and monitoring bores, updated groundwater chemistry bore specific trigger values). This GWOS will support two separate 5C GWL applications for the Superficial and Yarragadee aquifers.

Doral will be required to comply with the GWOS after 5C licences approval by the DWER. The commitments included in the GWOS are considered to be conditions of the GWLs.

2 Administrative Requirements

2.1 Other Groundwater Licenses

There are no other groundwater licenses already issued by the DWER that are relevant to this GWOS.

2.2 Staged Development of Water Licenses

Neither of the groundwater licence applications (for dewatering from the Superficial aquifer and water supply pumping from the Yarragadee aquifer) involve a staged development.

2.3 Previous Investigations of Water Source and Environment

Doral has completed a series of investigations covering hydrogeology, modelling, hydrology and environment, to assess the dewatering requirements and the potential effects that groundwater extraction may have on the aquifer, the environment and the other groundwater users. The most relevant of these are listed below:

- AQ2, Yalyalup Mineral Sands Project, Hydrogeological Assessment, May 2020.
- AQ2, Surface Water Assessment for the proposed Yalyalup Heavy Mineral Sands Project, September 2019.
- AQ2, Yalyalup Mineral Sands Operation, Site Water Balance, Project, May 2020.
- AQ2, Doral Yalyalup Operations, Surface Water Discharge Assessment, October 2019.
- AQ2, Yalyalup Mineral Sands Project, GDE Management Plan, October 2020.
- AQ2, Yalyalup Mineral Sand Project, Surface Water Management Plan, May 2021.
- ABEC, Acid Sulfate Soil Investigation and Management Plan (DMS17_004_ASSMP_001_EP_V4), August 2021.
- Ecoedge, A Review and Impact Assessment of Potential Water Drawdowns on Groundwater Dependent Ecosystems at the Proposed Yalyalup Mineral Sands Project, November 2019.
- Hydrosolutions, 2017. Initial Hydrogeological Assessment: Proposed Yalyalup Mineral Sands Mine, September 2017.

2.4 Water Resource Management / Allocation Plan

The Yalyalup project is wholly located within the Busselton-Capel Groundwater Area for the Superficial and Leederville aquifers and within the Busselton-Yarragadee Groundwater Area for the Yarragadee aquifer. All these groundwater areas are covered by the South West Groundwater Areas Allocation Plan produced by the DWER (DWER, 2009).

The Yalyalup project is located within the Wonnerup (Busselton Coast) Surface Water Management subarea and is not located within a proclaimed area for surface water management (DWER, 2009). The project is situated within the Lower Sabina River subcatchment area. The Lower Sabina River flows from below the Sabina Diversion Weir to the RAMSAR listed Vasse-Wonnerup Wetlands. The Lower Sabina, Lower Vasse, Abba and Ludlow rivers drain into the Vasse-Wonnerup Wetlands, before discharging through the Wonnerup Inlet into Geographe Bay.

2.5 Person Responsible

Contact details for the person responsible for implementation of the GWOS are:

Table 1: Responsible Person / Position

Name	Craig Bovell
Position	OSH&E Superintendent, Doral Mineral Sands Pty Ltd
Phone Number	(08) 9725 5444
Postal Address	Lot 501 Harris Road, PO Box 9155, Picton WA 6229
Email	craig.bovell@doral.com.au

2.6 Reporting

The annual water year for the Yalyalup mine is defined as 1 January to 31 December.

The reporting dates of this GWOS will remain in line with the reporting dates required as per the conditions of GWLs and are listed in Table 2.

Table 2: Reporting Dates

Item	Reporting Dates
Water use (metering) data	31 March annually
Annual Groundwater Monitoring Summary (GMS)	31 March annually
Triennial Groundwater Monitoring Review (GMR)	Every three years. Due date of the first report is to be announced

Annual reports will be submitted to the Bunbury office of the DWER (and/or via DWER Water Online Portal) and should follow the reporting structure detailed in DWER Operational policy 5.12: *Hydrogeological reporting associated with a groundwater well licence* (2009). An annual GMS report will not be required in the year that a triennial review is due.

An annual Groundwater Monitoring Summary (GMS) report will cover monitoring data recorded during the current water year and it will include:

- a location plan showing relevant bores, discharge sites and active mining cells;
- details of any bores which have been drilled, commissioned or decommissioned;
- current and historical rainfall data to compare long-term averages and variations;
- tabulated meter readings and monthly extraction volumes for each mining cell over the reporting year; water balance estimates;
- graphs of historical monthly and annual extraction data for each mining cell and combined dewatering output;
- tabulated chemistry data for nominated surface water sites and groundwater bores;

- graphs of historical chemistry data including pH, TDS (EC), alkalinity as HCO_3, sulfate:chloride ratio (SO_4:Cl^-) to clearly identify trends in each monitoring bore and show any indicators of acidification processes;
- tabulated water level data in metres (m) below ground level (bgl) and m AHD for the reporting period;
- graphs of historical water levels;
- an assessment of the effects of the licensee's draw on the groundwater resource and surface water as determined from the monitoring data;
- a comment on the licensee's compliance with the licence and associated monitoring commitments;
- an assessment of the monitoring program and recommendations for any changes to the program;
- provide any information or evidence needed to update information provided in the GWOS.

Every three years, Doral will provide a Groundwater Monitoring Review (GMR) prepared by a qualified hydrogeologist and will provide a complete history of groundwater monitoring over the life of the mine, including a detailed analysis of the aquifer response to groundwater extraction, comparison with modelled predictions and effects on surface water from its use, as monitored in:

- nominated surface water sites, groundwater production bores and groundwater monitoring bores as reported each year;
- DWER regional monitoring bores.

2.7 GWOS Duration

This GWOS will be effective for the life of each of the licences (i.e. Superficial and Yarragadee aquifers) for the Yalyalup mine, unless any changes are made by or with approval of the DWER.

2.8 Breach of GWOS

Any reportable breach of this GWOS will be communicated to the DWER as soon as reasonably practicable at the time of the breach and recorded in the annual GMS report.

2.9 GWOS Amendments and Review

Any changes to the conditions / commitments of the GWOS that are required during the period of the GWOS must be agreed by Doral and DWER, with the signatures of both parties on an GWOS Addendum.

This GWOS requires review at least three months before the expiry date of licences.

3 Scheme Description and Operating Rules

3.1 Mining and Dewatering Operations

The operational Yalyalup mine life is approximately 6 years, which includes:

- Pre-mine establishment phase – construction of the mine infrastructure and support facilities - the duration of this phase is expected to be approximately four to six months;
- Mining phase – progressive mining via a series of open-cut pits using dry mining techniques. The duration of this phase is expected to be about forty-two months (i.e. three years and six months). The total extent of mining and dewatering, including the staged mining zones (i.e. mining quarters), is shown on Figure 2.
- Mine closure phase - rehabilitation and closure of mining domains will be undertaken in accordance with the Mine Closure Plan. The duration of this phase is expected to be for up to two years, depending on the success of rehabilitation. The mined area will be rehabilitated back to pasture and / or native vegetation, depending on pre-mining conditions, consistent with the post-mine land use requirements.

Mining will be staged in order to minimise the area of disturbance, with the aim of achieving focused and effective management of the environmental factors at each pit location, prior to moving onto the next pit location. Each mining zone would be mined over a period of approximately three months. Dewatering of mine pits and associated drawdown of the water table will occur in a staged approach, with mine pits (blocks) being dewatered as per the mining schedule. Should more than one active mine pit be dewatered at any one time, then each dewatering pipeline will be metered separately by a suitable meter prior to discharge to the Drop Out Dam (DOD) and before it is transferred to the Process Water Dam (PWD). More details of the mining stages are provided in the ERD document (Doral, 2020).

Doral is planning to extract mineral sands from the Bassendean Sand and Yoganup Formation at the Yalyalup mine. The removed topsoil and overburden will be stockpiled. Ore will be mined in a series of cuts, to an approximate maximum depth of 10.5 m. Pits will be mined on a slight incline from the deepest point and then mined moving up-gradient in order to retain pit water within drainage channels to a sump at the deepest point on the pit floor. This form of dewatering is referred to as 'passive', as no dewatering apparatus (e.g. spears) are used to actively abstract water and groundwater drawdown below the base of the pit (Figure 3). The groundwater drawdown of any given pit will be related to the pit depth (i.e. up to 10.5 m). Mine pit dewatering is pumped from the sump to the DOD then to the PWD for reuse (Figure 4).

3.2 Water Distribution Network

Processing of ore will commence in-pit mining to the feed preparation plant, where after the slurry will be pumped to the wet concentration plant for further processing (Figure 4). Waste clay and sand materials from processing of this ore will be combined and backfilled into the mine voids using co-flocculation (co-disposal system) as a priority where possible. Thus the majority of clay tailing resulting from the primary mineral separation will be co-disposed to the pit void with the remaining surplus volume temporarily placed in a Tailing Storage Facility, herein referred to as Solar Evaporation Ponds (SEPs) to allow drying of the clay prior to harvesting and returning to the pit void.

The surface water runoff from the 'beaching' of the co-disposal and/or the decant water from the solar evaporation ponds is recycled back to the DOD and then to the PWD, prior to being re-entered into the separation process again and then to the mine voids and back as a full circuit water recycling process.

The DOD will be constructed adjacent to the PWD (Figure 5). The purpose of the DOD is to receive all return water from the site and to act as a settling pond to remove suspended solids from the water, prior to it entering the PWD.

The PWD provides the main water storage from which all process water demands are sourced, with the main inputs of water into the PWD from:

- Recycled process water (primarily water returned from co-disposed sand tails, and decanted from the SEPs);
- Groundwater from active mine pits during dewatering operations (pit inflows),
- Runoff from impervious disturbance areas (i.e. roads, buildings/structures and hardstands);
- Direct rainfall that falls over the surface of the PWD;
- Abstraction from production bore screened in the Yarragadee aquifer.

The outputs from the PWD are:

- Use of water in the wet concentration plant process;
- Evaporation;
- Discharges of clean water offsite in the event that onsite storage options are full (during extended rain events).

The DOD and PWD have proposed storage capacities of 20,000 m^3 and 40,000 m^3, respectively.

3.3 Projected Water Balance

The site water balance assessment (AQ2, 2020a) using the GoldSim water balance model was undertaken to estimate the likely groundwater make-up supply volume from the Yarragadee production bore, which may be required to support the operation, as well as the potential discharge volumes of surplus water. Two climatic conditions (dry and wet) have been modelled, to incorporate the dry and wet dewatering scenarios.

Within the water balance logic and inputs, the recycling of return water from the hydraulically returned tailings (i.e. sand and clay fines pumped to the mine void and solar evaporation ponds) is prioritised, followed by the use of dewatering (site stormwater and groundwater) as the second priority, with the supply of water from the external Yarragadee production bore only used to supplement these sources during periods of water shortfall. Pumping from the Yarragadee production bore will only occur if the total storage volume in the site storage ponds drop below the equivalent of 2 days of supply (nominally 10,000 m^3).

Based on the water balance model prediction results, a peak make-up water demand of 1.3 GL/year has been estimated to be required from the Yarragadee production bore, to support a peak mine water demand of 1.6 GL/year. Make-up water requirements are expected to be the highest during drier periods, with the highest demand for supplementary groundwater expected to be in the first year of operation. To allow some contingency, a GWL from the Yarragadee of 1.6 GL/year should be applied for to cover the full mine water demand.

The water balance assessment indicates that during wet periods, there may not be sufficient water demand or on-site storage capacity to manage all the water collected within the pit from stormwater runoff and dewatering, plus runoff collected within the PWD/DOD. Therefore, discharge of surplus water off-site may be required via licenced discharge points. A surface water discharge licence will be required to be obtained from the DWER to allow the operations to manage surplus water from the site.

It should be noted that water from SEPs have not been included within the water balance model, as the return water and losses at these ponds are assumed to have been taken into account when determining the net mine water demand of 1.6 GL/year.

A schematic water balance for the Yalyalup project is shown in Figure 4.

3.4 Water Source Description

3.4.1 Dewatering

Dewatering of mining areas will occur via in-pit sumps, located at the deepest point of the pit, with water pumped from the sump to the DOD (either directly or via an open drain and then gravity fed) and then to the PWD. The extracted water will be sourced from the Superficial aquifer, which comprises the Bassendean Sand, Guildford Formation and Yoganup Formation, with a maximum saturated aquifer thickness of 9 m in the mine area. The Guildford Formation is present between the Bassendean Sand and Yoganup Formation and is of low permeability, owing to its more clayey nature. The permeability of the superficial aquifer is variable and depends on sediment type, with saturated sands having higher permeability than clays. The superficial deposits commonly contain ironstone caprock, colloquially known as Coffee Rock, in the zone of water table fluctuation and at the site, it is generally 2 to 3 m thick and is exposed at the surface in parts of the projects (mainly in the western side). At the project, the Yoganup Formation forms the main portion of the aquifer, while the Bassendean Sand is generally only saturated in the wet season. The Yoganup Formation comprises leached and ferruginous beach coarse grained sand, with localised concentrations of heavy minerals and some sandy silt and clay layers. The thickness of the Superficial Formation is irregular, reaching a maximum of 12 m at the project, but generally being 7-8 m thick.

3.4.2 Water Supply

One production bore was drilled and screened in the Yarragadee aquifer, to supply sufficient top-up water for mining operations. The production bore location is showed in Figure 5, while the construction details for this bore are summarised in Table 3.

Doral will ensure that the schedule of production and monitoring bores will be kept up to date and the DWER will be notified of any bore alterations or additions that are made.

Table 3: Yarragadee Production Bore Details

Bore ID	Coordinates		Depth Cased	Top of Casing (TOC)	TOC Elevation	Screened Interval	Aquifer
	Easting (mAHD)	Northing (mAHD)	(m)	(m agl)	(mAHD)	(m)	
YA_PB01	361182	6271638	361.7	0.39	29.39	295.7-355.7	Yarragadee (Unit 3)

3.5 Abstraction Operating Rules

The following abstraction operating rules will apply.

3.5.1 Dewatering Operation

During the operational period, Doral is committed to the following:

- Doral will not exceed the maximum water draw (i.e. annual water allocation) of 750,000 kL/year (i.e. 0.75 GL/year) from the Superficial aquifer;
- The volume of water taken from the individual pits dewatered under the Superficial GWL, will be metered using suitable type flow meters, that will be installed in accordance with the provisions of the document "Guidelines for water meter installation" (DWER, 2009). The installed meters accuracy will be maintained within plus or minus 5% of the volume metered, in field conditions;
- Should more than one active mining pit be dewatered at any one time, then the pipeline from each pit will be metered separately by a suitable meter, before discharge to the DOD;
- Pits will be dewatered as required, so no constraints have been set on dewatering pumping rates from the mine pits to the DOD. The pumping rate into the DOD from the in-pit sumps will vary depending on the pit inflows at each active pit (with monthly groundwater inflows in the range of 0 kL/d to 4,000 kL/d, generally less than 2,000 kL/d throughout the mine life), and dependent on additional external inflows e.g. tails return water, stormwater catchment;
- Maintain a record of flow meters for the dewatering programme and submit to the DWER, via DWER Water Online Portal.

3.5.2 Aquifer Dewatering Volumes

Measurement of the actual volume of groundwater abstracted during mine dewatering is complicated by the inflow of surface water, direct rainfall into the open pits and the return water from the sand tails and the SEPs to the sumps. The resulting total volume of water pumped from the in-pit sumps is therefore much greater than the volume of pure groundwater removed from the aquifer.

All water recorded as having been drawn from the active mining pits via in-pit sumps is to be used for compliance against the GWL annual allocation, but will require to be reduced as best as can be reasonably calculated by the:

- Volume of stormwater (i.e. direct rainfall) entering the active pit dewatering sump;
- Volume of stormwater from catchments directed to the active pit dewatering sump;
- Volume of return sand tails water flowing to the active pit sump;
- Volume of SEP decant water flowing to the active pit sump.

A simple water balance approach will be employed to allow all volumes of indirect water directly collected in the pit throughout the year to be deducted from the total volume of water abstracted during dewatering. Daily rainfall data collected at the nearest Bureau of Meteorology (BoM) weather station, Busselton Aero (Station No. 9603) will be used to calculate the volume of rainfall entering the active pit. As the mine progresses, the surface area of the active dewatering pit(s) will be surveyed and therefore allow for the water catchment to be calculated using GIS software and mine survey data.

The total volume of groundwater abstracted during mine dewatering will be compared with the annual water allocation to determine compliance with the Superficial GWL condition.

3.5.3 Water Supply Operation

During the operational period Doral commits that:

- The mine will not exceed the maximum water draw of 1,600,000 kL/year (i.e. 1.6 GL/year) from the Yarragadee aquifer;
- The volume of water taken under the Yarragadee GWL will be metered using suitable type flow meters, that will be installed in accordance with the provisions of the document “Guidelines for water meter installation” (DWER, 2009). The installed meters accuracy will be maintained within plus or minus 5% of the volume metered, in field conditions;
- Any Yarragadee production bore will be equipped with an electric submersible pump with suitable operational protection (e.g. low-flow and high-temperature cut-off switches);
- Any Yarragadee production bore will be operated according to water demand, with no set schedule, and a manually set timer to ensure the bore does not run to waste.

3.6 Water Re-Use

Passive recharge back to the Superficial aquifer will occur through the progressive backfill of co-disposed sand tails slurry to the mine void and any water from this operation will be recycled back to the DOD/PWD for re-use. It is anticipated that all water collected on-site, including groundwater pumped from the active mine pits during dewatering, surface water inflow into open pits, rainfall into the open pits, SEPs and sand tails return and surface runoff collected from the mine site (that did not enter the open pits), will be fully utilised during the wet concentration plant process.

Water required for dust suppression activities may be sourced from water storage sources such as the DOD and/or PWD and the return water sumps.

The Yalyalup project will operate in a water efficient manner, thus surplus water generation is only likely to be as a direct result of rainfall. Therefore, the possibility of providing an off-site water supply to a third party is limited, however, upon arrangement with Doral and the local authorities (e.g. DFES, Rural fire brigade), there is a possibility of water being provided to assist with a reasonable request such as bush fire management or other significant situations. Any requested will be considered by Doral, in line with their clear commitment to the safety and wellbeing of the adjacent community.

3.7 Off-Site Discharge Water

In the event of all water storages (i.e. mine voids, PWD, DOD, SEPs and drains) being at their full capacities and prolonged heavy rainfall occurs within the pit catchment area, then excess water will have to be discharged off-site site via proposed controlled “Licensed Discharge Point” (located at the eastern end of Lot 1293/3752 on Princefield Road within the Development Envelope), as shown on Figure 5. The excess water could include a mixture of groundwater, surface inflow, direct rainfall, SEP returns, sand tails returns and surface runoff collected from the mine site. Excess water flows that will exit the PWD will be measured at the proposed “Licensed Discharge Point”. Once discharged from the PWD, water will move through the on-site drainage network into the Princefield Road drain flowing west into Woddidup Creek/drain, before reaching the Lower Sabina River northwest of the mine, where it will ultimately discharge into the Vasse-Wonnerup Ramsar wetlands.

During extreme rainfall events, excess water is proposed to be able to be discharged off the mine site via the proposed “Emergency Discharge Point”, located in the north western corner of the Development Envelope, as indicated on Figure 5. The discharged water will be connected to the existing roadside drain along the Princefield Road.

A V-notch flow metering gauge will be installed at the proposed Licenced Discharge point and the Emergency Discharge location is proposed to be actively enacted by pump to ensure it is as a last resort only and upon which the pump flow curves will enable flow measurement.

Doral will ensure that the DWER will be notified of any alterations or additions that are made in relation to off-site discharge water locations.

It should be noted that all runoff from catchment areas upstream of the mine envelope will be diverted around mining operations and discharged to a downstream water course. Bunding and drainage shall be installed to ensure up-gradient stormwater does not flow into the mining area and potentially impede the natural surface water flows of the region. In order to minimise the potential impacts on local surface water features, a Surface Water Management Plan (SWMP) for the Yalyalup mine has been prepared (AQ2, 2021) and will be implemented by Doral.

3.8 Surface Water

A network of surface water monitoring sites has been identified adjacent to the Yalyalup project area. Fourteen surface water monitoring sites (YALSW01 to YALSW14) are shown on Figure 6, and site details are summarised in Table 4. Monitoring of surface water levels and quality at these locations allows recording of any unseasonal increases in water levels, seasonal fluctuations and any changes in basic water chemistry, pre-mining and during the period of the mine operations.

One additional surface monitoring site YALSW15, located upstream of site YALSW14, is proposed to be added to the surface water monitoring programme, to monitor the water quality chemistry of the catchment that is diverted along the eastern boundary of the Disturbance Envelope, located upstream of “the Licenced Discharge Point”.

Doral will ensure that the DWER will be notified of any alterations or additions that are made in relation to surface water monitoring locations.

Table 4: Details of Surface Water Monitoring Sites

Site Name	Approximate Location (GPS surveyed)			Comments
	Eastings (MGA94)	Northings (MGA94)	Elevation (mAHD)	
YALSW01	355307	6269882	23	Original Sabina River channel. Limited area surface flows ~1km Downstream from Sabina Diversion weir.
YALSW02	356614	6269990	24	Artificial drainage flows from paddocks within Lot 421
YALSW03	357034	6270001	26	Woddidup Creek flows, semi regional, ~3.0km x 2.0km catchment
YALSW04	357848	6270038	23	Ag dam Lot 758. Seepage from Bassendean Sands in close proximity to proposed mining
YALSW05	359214	6270070	29	Un-named Creek, catchment estimated 2.0km x 2.0km
YALSW06	356099	6270231	21	Optional, alternate site if YALSW02 access is poor
YALSW07	356887	6270304	20	Farm dam
YALSW08	356081	6270852	20	Optional, alternate site if YALSW02+06 access is poor
YALSW09	357805	6270840	22	Un-named Creek/Artificial drains in centre of project
YALSW10	355520	6271611	18	Downslope sampling site for western margins of project.
YALSW11	356540	6271665	18	Woddidup Creek flows, Downslope flows from central west of project area. No Mixing with Princefield Drain
YALSW12	356866	6271676	18	Un-named Creek/Artificial drains in centre of project. No Mixing with Princefield Drain.
YALSW13	356997	6271686	18	Roadside drain Downslope flows from north east of project area.
YALSW14	358604	6271766	21	Roadside drain Downslope flows from north east of project area
YALSW15	359297	6271785	21	Proposed monitoring site – upstream of proposed “Licenced Discharge Point”

4 Identifying and Managing Impacts

A summary of the key issues relating to the proposed groundwater extraction from the Superficial and Yarragadee aquifers, their management objectives, measurements and responses, is presented in Table 5.

These issues are to be managed if impacts are identified from the monitoring programs (Section 5) and are outlined in the Contingency Plan in Section 6.

4.1 Potential Impacts on Neighbouring Landowners

4.1.1 Mine Dewatering

AQ2 prepared a numerical groundwater flow model to assess the dewatering requirements and groundwater drawdown associated with the development of the Yalyalup project.

The modelling indicated that all Superficial aquifer licenced bores are located outside of the predicted 0.1 m drawdown contour and are unlikely to be impacted by the Yalyalup dewatering operations.

Additionally, there are several unlicenced bores which are screened in the Superficial aquifer that are within the modelled extent of the 0.1 to 0.25 m drawdown contours. Most of them have either been decommissioned or used by DWER for monitoring purposes. There are only five unlicenced bores (YA_MB14_W, YA_MB18_W, YA_MB19_W, 20005168, and Lot421_Bore2) that have been reported by Doral as being in use and three of them (YA_MB14_W, YA_MB18_W, YA_MB19_W) fall within the modelled drawdown zone of between 0.1 to 0.25 m due to mining dewatering – this limited drop in water level is unlikely to influence their supply potential.

The numerical model also indicated that small drawdowns (less than 0.5 m) are predicted in the Leederville aquifer due to dewatering of the overlying Superficial aquifer. There is one Leederville aquifer licences (GWL94291) that have bores located within the drawdown extent of 0.25 m and could be affected by mining related dewatering. However, these drawdowns are predicted to be temporary in duration and relatively minor in terms of any effect on the bore’s supply potential.

It is therefore unlikely that short-term dewatering at the proposed Yalyalup mine will have any long-term adverse impacts on the water supply potentials of other users in the Superficial and Leederville aquifers.

Regular monitoring of groundwater levels in Superficial and Leederville aquifers during the mining operation will provide information on the actual induced drawdowns and impacts on these aquifers.

The extent of dewatering impacts will be monitored according to Table 10 (Section 5.2), with results reviewed on a quarterly basis. If a concern is raised from another local landowner regarding potential impacts to water supplies or vegetation due to dewatering, Doral will undertake an assessment of the monitoring data from nearby monitoring bores, to further determine the cause of impact. Should this assessment and further investigation determine that Doral’s operation is having an impact on a neighbour’s water supply, Doral will put in place interim remedial measures as soon as practical to effectively ‘make good’ the water supply and inform the DWER of the interim actions taken and proposed actions for the future.

4.1.2 Yarragadee Water Supply Abstraction

Additionally, the AQ2 numerical groundwater model was used to assess the potential impacts of the planned abstraction from the Yarragadee aquifer on the environment and other groundwater users.

Results of the modeling indicate that the proposed extraction of 1.6 GL/year from the Yarragadee aquifer will be unlikely to have any adverse impacts on the water supply and water quality potentials of the aquifer systems. At the site, the Yarragadee aquifer is a confined aquifer with limited downward leakage from overlying aquifers. This is due to the presence of low permeable confining layers between the aquifers, in particular with the deep Leederville (Vasse Member) aquifer.

There are two known licenced bores under GWL110298 and GWL156776 that abstract water from the Yarragadee aquifer that are located within the modelled extent of the 0.5 m and 1 m drawdown cones developed around the production bore (i.e. within 4.2 and 5.3 km from the YA_PB01, respectively).

The numerical model also indicated that small drawdowns (less than 0.1 m) are predicted in the Leederville aquifer due to pumping from the underlying Yarrgadee aquifer.

However, given the short duration of the abstraction from YA_PB01, the impacts to other Yarragadee and Leederville aquifer users is not expected to be significant. It should be noted that continuously pumping from YA_PB01 has been modelled, while it is planned that YA_PB01 will be used only when required, most likely during summer periods when there is a shortfall of water supplied from rainfall runoff and pit dewatering. Therefore, during the winter periods when minimal to no pumping from YA_PB01 occurs, water levels will recover and the actual drawdowns in the Yarragadee and Leederville aquifers will be smaller than predicted.

Regular monitoring of groundwater levels in Leederville and Yarragadee aquifers during the mining operation will provide information on the actual induced drawdowns and impacts on these aquifers.

The extent of abstraction impacts will be monitored according to Table 10 (Section 5.2), with results reviewed on a quarterly basis. If a concern is raised from another local landowner regarding potential impacts to water supplies due to abstraction from the Yarragadee production bore, Doral will undertake an assessment of the monitoring data from nearby monitoring bores to further determine the cause of impact. Should this assessment and further investigation determine that Doral’s operation is having an impact on a neighbour’s water supply, Doral will put in place interim remedial measures to ‘make good’ the water supply as soon as practical and inform the DWER of the interim actions taken and proposed actions for the future.

Table 5: Summary of Key Issues, Management Objectives and Management Responses

Potential Issue/Risk	Management Objective	Measurement	Management Response
Dewatering Operation			
Dewatering	To keep water table in the Superficial aquifer at the base of active pit(s) to prevent flooding	Water levels regularly monitored in the active pit(s) and in the Superficial monitoring bores	Increase abstraction from in-pit sumps. Review mining schedule to reduce extraction rates.
Exceeding Superficial Aquifer GWL allocation	To not exceed the Superficial aquifer annual allocation limit	Totalising meters installed and discharge volumes measured for each active mine pit	Investigate changes to pumping or mining schedules to reduce dewatering rates. If the cumulative abstraction reaches a warning trigger of 80% of the annual allocation limit, an internal review will be undertaken to assess the reason for increased inflows to the pit. If the review indicates the potential for the annual allocation limit to be exceeded, DWER will be contacted to discuss an amendment to the annual allocation limit.
Water levels in Superficial aquifer	To not have excessive drawdowns in the Superficial aquifer due to extraction	Water levels regularly monitored in the Superficial monitoring bores	Assessment of water level trends in the Superficial monitoring bores to further determine impact. Review mining schedule to reduce extraction rates or minimise period of exposure of the area of concern. Consider artificial aquifer recharge to reduce impacted areas.
Water levels in Leederville aquifer	To not have excessive drawdowns in the Leederville aquifer due to extraction from the overlying Superficial aquifer	Water levels regularly monitored in the Leederville monitoring bores	Assessment of water level trends in the Leederville monitoring bores to further determine impact. Review pumping or mining schedule to reduce extraction from the area of concern
Water quality in Superficial aquifer	To not have excessive long-term increase in salinity or significant change in chemical composition of water due to mining	Measure field pH and electrical conductivity and obtain chemical analyses of water from representative monitoring bores	Assessment of water quality trends in the Superficial monitoring bores to further determine impact. Review reasons for changes in chemistry and propose management options to limit or reverse changes.
Water quality in Leederville aquifer	To not have excessive long-term increase in salinity and significant change in chemical composition of water due to dewatering	Measure field pH and electrical conductivity, and obtain chemical analyses of water from representative monitoring bores	Assessment of water quality trends in the Leederville monitoring bores to further determine impact. Review reasons for changes in chemistry and propose management options to limit or reverse changes.

Table 5 (cont.) Summary of Key Issues, Management Objectives, and Management Responses

Potential Issue/Risk	Management Objective	Measurement	Management Response
Dewatering Operation			
Leakage from Solar Evaporation Ponds (SEPs)	To not have significant long-term change in groundwater levels and chemical composition of water due to deposition of tailings into SEPs during mining	Water level and water quality monitoring in the Superficial aquifer for potential leakage from SEPs	Assessment of water levels and water quality in the Superficial aquifer via network of monitoring bores. If necessary, shallow bores downstream and adjacent to SEPs will be installed to reduce size of groundwater mound and remove contaminated water.
Off-site discharge of water	To not allow any adverse impacts to water quality within the nearby drains (Princefield Road drain and Woddidup Creek/drain) due to off-site discharge of water during emergency discharge events	Water quality monitoring in the PWD and the off-site discharge points, when required	Provision for sufficient capacity to allow for settling time of surface water. Adequate surface water treatment to maintain water quality parameters (e.g. pH management) to within environmental trigger values. Assessment of water quality in the PWD and if necessary (i.e. triggers exceeded), then treatment of the process water through the addition of a suitable alkaline material to the ore feed and or the tails return water sump, until the water is above the trigger values. Whilst the process water dam quality is above of the trigger values, discharge of process water off site will cease.
Abnormal surface drainage	To manage any unseasonal increase in surface water flows and water quality	Surface water monitoring	Assessment of surface water flows and water quality to further determine any unseasonal changes
Acid Sulphate Soils	To not allow the oxidation of PASS due to mining operations	Dewatering effluent water quality monitoring, especially pH, Fe and SO_4	Increase monitoring frequency of water quality of the abstracted water from the pit and treat with neutralising agent (e.g. lime), if necessary
	To not allow off-site impacts to groundwater, due to the release of acid and mobilization of metals	Water quality monitoring in the Superficial aquifer for potential ASS impacts	Any exceedance of chemistry trigger levels in the Superficial aquifer, must be investigated for potential ASS site contamination and, if necessary, implement contingency actions specified in the ASS Management Plan
Groundwater Dependent Ecosystems (GDEs)	To not adversely impact (directly or indirectly) the health of GDE vegetation along the McGibbon Track due to dewatering	Water Level monitoring in the Superficial aquifer in bores directly adjacent to the McGibbon Track Monitoring of leaf water potential and vegetation health	Development and implementation of GDE Management Plan Frequent assessment of water levels in the Superficial aquifer via network of monitoring bores and if water levels are below the average low annual measured water level in the bores adjacent to the McGibbon Track, increase vegetation monitoring. If any exceedance of water level triggers (i.e. >1.5 cm/week or >25 cm below the average low annual measured water level) or vegetation triggers (i.e. Leading and Lagging Indicator triggers) artificially supplement the hydrological regime (via surface and/or subsurface irrigation using clean Yarragadee groundwater).

Table 5 (cont.) Summary of Key Issues, Management Objectives, and Management Responses

Potential Issue/Risk	Management Objective	Measurement	Management Response
Dewatering Operation			
Impacts on other adjacent landowners	To not adversely affect the productivity of pasture/horticulture due to mine dewatering	Water level and water quality monitoring in the Superficial monitoring bores nearby the area of concern	Investigate concerns from the local landowners; Assessment of water levels and water quality in the Superficial aquifer to further identify impact and identify measures to reduce impacts.
	To not adversely affect the groundwater availability in the Superficial aquifer to other users, due to mine dewatering	Water level monitoring in the other user's Superficial bores	Assessment of water level trends in the Superficial and Leederville monitoring bores to further determine impact. Provide an alternative source of water of similar quality and quantity to meet usage requirements until groundwater levels return to normal.
	To not adversely affect the groundwater availability in the underlying Leederville aquifer to other users, due to mine dewatering	Water level monitoring in the other user's Leederville bores	
Water Supply Operation			
Reliable water supply	To supply sufficient water, within the Yarragadee licence allocation limit	Totalising meters installed and discharge volumes measured for production bore.	Investigate additional (alternative) option to supply sufficient water for ore processing; Development of additional production bore, if required. Ongoing innovation in water recycling and reuse across the site
Water levels in Yarragadee aquifer	To not have excessive drawdowns in the Yarragadee aquifer due to abstraction	Water levels regularly monitored in the Yarragadee production and monitoring bores	Assessment of water levels in all Yarragadee bores to further determine impact. Reduce or amend pumping operation of the production bore
Water levels in Leederville aquifer	To not have excessive drawdowns in the deep (Vasse Member) Leederville aquifer due to abstraction from the underlying Yarragadee aquifer	Water levels regularly monitored in the deep Leederville (Vasse Member) monitoring bores	Assessment of water levels in all Leederville (Vasse Member) bores to further determine impact. Reduce or amend pumping operation of the production bore
Water quality in Yarragadee aquifer	To not have excessive long-term increase in salinity and significant change in chemical composition of Yarragadee water due to abstraction	Measure field pH and electrical conductivity, and obtain chemical analyses of water from production bore	Assessment of water quality in the Yarragadee production bore to further determine impact. Reduce or amend pumping operation of the production bore, if appropriate.
Impacts on other users	To not adversely affect the groundwater availability in the underlying Leederville aquifer to other users due to mine dewatering	Water level monitoring in the other user's Leederville bores	Assessment of water level trends in the Leederville and Yarragadee monitoring bores to further determine impact. Provide an alternative source of water of similar quality and quantity to meet usage requirements until groundwater levels return to normal.

5 Monitoring

The reporting dates for dewatering and water supply activities are outlined in Table 2.

5.1 Water Use Monitoring

A totalising (cumulative) flow meter will be installed at each active in-pit and Yarragadee water abstraction source, V-notch flow gauge will be installed at the proposed “Licensed Discharge Point” and proposed “Emergency Discharge Point” will be measured by flow rates (Figure 5). The proposed extraction monitoring programme is given in Table 6.

Table 6: Proposed Abstraction Monitoring Programme

Monitoring Purpose	Draw Point ID	Description of Meter Installed (Make, Serial No., Installation Date)	Meter Maintenance / Calibration Schedule	Frequency of Recording Meter Data
Pit dewatering volume	Pit Dewatering	To be confirmed	Maintenance – Annually Calibration – As required	Weekly
Yarragadee abstraction volume	Proposed Production Bore YA_PB01	To be confirmed		Monthly
Off-site Licenced Discharge Volume	Proposed Licensed Discharge Point	V-notch	Not applicable	Daily (when in use)
Off-site Emergency Discharge volume	Proposed Emergency Discharge Point	To be confirmed		Daily (when in use)

As the details of all flow meters for the pit dewatering programme are not yet known, once installed the details will be provided to the DWER when available.

The water meters will be inspected regularly for faults, maintenance will be undertaken as required and calibration will be carried out according to the manufacturer’s specifications. Details of any significant meter maintenance and replacement will be collated throughout the water year and incorporated into the annual monitoring summary.

5.2 Water Level Monitoring

Doral has drilled and installed 12 monitoring bores (i.e. YA_MB01S to YA_MB12S) across the proposed Yalyalup site, with 6 bores being installed in December 2017 and the remaining 6 bores in June 2019. All these monitoring bores were drilled to the base of the Superficial Formation (i.e. Yoganup Formation) and screened across the all Superficial Formation units. Additionally, five monitoring bores (YA_MB33_GDE to YA_MB37_GDE) have been drilled and constructed into the Superficial aquifer in May 2020, to allow monitoring of water level changes along the McGibbon Track, where a sensitive GDE vegetation has been identified. Water level monitoring will be conducted to establish a pre-disturbance baseline and pre-dewatering and then more frequently during active dewatering activities adjacent to this area. An additional 22 existing DWER and private bores have been monitored in order to obtain the baseline groundwater monitoring data from the Superficial and Leederville aquifers (i.e. 10 Superficial and 12 Leederville monitoring bores).

Locations of the existing groundwater monitoring bore network are shown in Figures 10 and 11. Details of Doral’s monitoring bores are presented in Table 7, whereas for the private landowner bores are presented in Table 8.

Table 7: Existing Monitoring Bore Details

Bore ID	Coordinates (MGA, Zone 50)		Ground Elevation#	Current Cased Total Depth#	Top of Casing (TOC)	TOC Elevation	PVC Casing Diameter	Screened/ Slotted Intervals	Aquifer	Status
	Easting (m)	Northing (m)	(mAHD)	(mbgl)	(mAHD	(mbgl)	(mm)	(mbgl)		
YA_MB01S	357253	6270021	23.46	5.01	24.18	0.72	50	1-7	Superficial	Current
YA_MB02S	356760	6270882	20.23	7.16	21.17	0.94	50	3-9	Superficial	Current
YA_MB03S	356989	6271678	18.76	8.66	19.22	0.46	100	1.8-7.8	Superficial	Current
YA_MB04S	357789	6270637	22.86	7.56	23.57	0.71	50	3-9	Superficial	Current
YA_MB05S	357787	6270960	21.80	7.64	22.28	0.48	100	1.5-7.5	Superficial	Current
YA_MB06S	357960	6271720	20.52	7.43	20.95	0.43	100	1.3-7.3	Superficial	Current
YA_MB07S	358606	6270858	25.04	7.26	25.83	0.79	50	2-8	Superficial	Current
YA_MB08S	358589	6271310	23.24	9.42	23.65	0.41	100	3.3-9.3	Superficial	Current
YA_MB09S	359401	6270501	30.58	7.65	31.2	0.62	50	2-8	Superficial	Current
YA_MB10S	359305	6270896	28.51	4.65	29.26	0.75	50	1-7	Superficial	Current
YA_MB11S	359295	6271545	24.69	8.22	25.14	0.45	100	1.8-7.8	Superficial	Current
YA_MB12S	359159	6271808	22.79	8.51	23.24	0.45	100	2.5-8.5	Superficial/ Leederville	Current (artesian flow)
YA_MB33_GDE	358889	6271018	25.78	3.97	26.43	0.65	50	0.5-4.0	Superficial	Current
YA_MB34_GDE	358725	6271158	24.61	6.26	25.22	0.61	50	0.4-6.4	Superficial	Current
YA_MB35_GDE	358599	6271570	21.98	6.0	22.54	0.56	50	0.5-6.0	Superficial	Current
YA_MB36_GDE	359075	6270792	27.95	5.41	28.56	0.61	50	0.5-5.5	Superficial	Current
YA_MB37_GDE	359475	6271786	24.47	4.92	25.01	0.54	50	0.5-5.0	Superficial	Current

magl = metres above ground level
mbgl = metres below ground level
mbtoc = metres below top of casing

Total depth of the bore was measured during May & June 2019, June 2020 site visits

Table 8: Existing Private User's Bore Details

Bore ID	Bore ID (Other Name)	Coordinates (MGA, Zone 50)		Ground Elevation	Screened Depth	Top of Casing (TOC)	Aquifer	Status
		Eastings (m)	Northings (m)	(mAHD)	(mbtoc)	(mabgl)		
YA_MB14_W	61012243, 20005101	358052	6272283	20.5	3.6	0.40	Superficial	Current windmill, suitable for water levels monitoring only
YA_MB15_W	61012250, 20005114	358644	6270521	25	5.5	0.50	Superficial	Current bore, suitable for water levels monitoring only
YA_MB16_W	61012251, 20005115	357995	6269748	28	8.54	0.25	Superficial	Current bore, suitable for water levels monitoring only
YA_MB17_W	61012287, 20005165	357282	6270170	23.5	3.7	0.01	Superficial	Current bore, suitable for water levels monitoring only
YA_MB18_W	61012288, 20005166	357402	6269919	23.8	4.3	0.00	Superficial	Current bore, suitable for water levels and quality monitoring
YA_MB19_W	61012291, 20005169	356737	6271639	18.1	3.8	0.10	Superficial	Current windmill, suitable for water levels monitoring only
YA_MB20_W	61012361, 20005253	359000	6269832	30.5	3.4	0.10	Superficial	Current bore, suitable for water levels monitoring only
SCPD28A	61000055	358612	6271752	21.2	9	0.00	Superficial	DWER bore, suitable for water levels and quality monitoring
SCPD29A	61000057	359916	6269605	34.8	9.5	0.00	Superficial	DWER bore, suitable for water levels and quality monitoring
TS012M	TS012M	358329	6270015	29.24	9	0.48	Superficial	Current bore, suitable for water levels and quality monitoring
YA_MB21_W	61012362, 20005254	359572	6270576	30	17	0.25	Leederville	Defunct bore, suitable for water levels and quality monitoring
YA_MB22_L	61012444, 20005356	357207	6270142	23.5	16.5	0.05	Leederville	Defunct bore, suitable for water levels and quality monitoring
YA_MB23_L	61014661, 20083645	358326	6272028	20.5	42	0.10	Leederville	Current bore, suitable for water levels and quality monitoring
YA_MB24_W	61010183, 23040930	357928	6271837	19.8	48	0.45	Leederville	Current windmill, suitable for water levels monitoring only
YA_MB30_W	61070112, 23073124	357993	6269748	28	69	0.10	Leederville	Current bore, suitable for water levels monitoring only
YA_MB25_L	LOT200_BORE	356347	6270064	22.25	70	0.10	Leederville	Current bore, suitable for water quality monitoring (pump in bore)
YA_MB26_W	LOT229_WM2	356712	6271194	19.2	16	0.15	Leederville	Defunct windmill, suitable for water levels monitoring only
YA_MB27_L	LOT421_BORE1	357323	6269971	25	48	0.30	Leederville	Current bore, suitable for water quality monitoring (pump in bore)
YA_MB28_W	LOT552_BORE	356220	6269870	23	70	0.00	Leederville	Current bore, suitable for water quality monitoring (pump in bore)
YA_MB29_W	LOT667_WM1	358311	6269190	29	11	0.35	Leederville	Current bore, suitable for water quality monitoring (pump in bore)
YA_MB31_L	LOT668_BORE2	357996	6269745	28	25.3	0.25	Leederville	Current bore, suitable for water levels and quality monitoring
YA_MB32_L	LOT758_BORE	358002	6270118	25.5	30	0.10	Leederville	Current bore, suitable for water quality monitoring (pump in bore)

During April to June 2021, a nest of four monitoring bores (YA_MB13Y, YA_MB13V, YA_MB13M and YA_MB13S), located 10-25 m to the west of the Yarragadee production bore YA_PB01 (Figure 5), were drilled separately into the Yarragadee, deep Leederville (Vasse), shallow Leederville (Mowen), and Superficial aquifers, respectively, to allow monitoring of water level changes in each aquifer during the test pumping and during future mining operations. Details of the nested monitoring bores are listed in Table 9.

Table 9: Nested Monitoring Bore Details

Bore ID	Coordinates		Depth Cased (mbgl)	Top of Casing (magl)	TOC Elevation (mAHD)	Screened Interval (mbgl)	Aquifer
	Eastings (m)	Northings (m)					
YA_13S	361158	6271638	5.5	0.58	29.58	1-5.5	Superficial
YA_13M	361162	6271638	17.5	0.56	29.56	11.5-17.5	Leederville (Mowen Member or shallow Vasse Member)
YA_13V	361168	6271638	89	0.55	29.55	83-89	Leederville (deep Vasse Member)
YA_13Y	361173	6271638	349	0.52	29.52	289-349	Yarragadee

The proposed water-level monitoring programme is listed in Table 10.

Water level notes:

- Water levels will be measured from a standard measuring point; for example - top of casing. Any change in the position of the reference point will be recorded and previous measurements adjusted accordingly;
- Water levels will be reported as metres below the standard reference point (mbtoc), below ground level (mbgl) and (if surveyed) metres above the Australian Height Datum (mAHD);
- Water levels will be recorded to the nearest centimeter;
- A note will be made as to whether the Yarragadee production bore is pumping or not at the time of the manual measurement;
- The Yarragadee monitoring bore YA_MB13Y and the Leederville (Vasse Member) monitoring bore YA_MB13V will have data loggers installed, to monitor water level changes in the Yarragadee and Leederville (Vasse Member) aquifers.

Table 10: Proposed Water Level Monitoring Programme

Monitoring Purpose	Monitoring Site Type	Monitoring Site ID	Monitoring Frequency
Dewatering Operation			
Superficial aquifer water level	Doral monitoring bores	YA_MB01S to YA_MB12S	Monthly
		GDE monitoring bores (YA_MB33_GDE to YA_MB37_GDE)	Monthly (during baseline and pre-dewatering) and Weekly (during active adjacent dewatering)
	Existing other user's bores (local)	SCPD28A, SCPD29A, TS012M, YA_MB14_W, YA_MB15_W, YA_MB16_W, YA_MB18_W, YA_MB19_W, YA_MB20_W	Monthly
Leederville aquifer water level	Existing other user's bores (local)	YA_MB21_W, YA_MB22_L, YA_MB23_L, YA_MB24_W, YA_MB26_W, YA_MB31_L	Monthly
Water Supply			
Yarragadee aquifer water level	Doral production bore	YA_PB01	Monthly
	Monitoring bores (local)	Nested monitoring bores: YA_MB13S, YA_MB13M, YA_MB13V*, YA_MB13Y*	
	Existing other user's bores (regional)	61000125 (providing DWER access to the bores)	Monthly
Leederville (Vasse Member) aquifer water level	Existing monitoring bores (regional)	YA_MB30_W	Monthly

* Pressure Transducer (data logger) installed

5.3 Water Quality Monitoring

The proposed programme to monitor water quality is given in Table 11.

Water chemistry notes:

- All methods and equipment used in water quality sampling should be undertaken in accordance with the Australian Standard AS/NZS 5667 (1998) and wherever possible, a NATA registered laboratory should undertake the analyses, using NATA accredited analysis methods;
- The method (e.g. EC correction factor; gravimetric) used for the determination of TDS must be specified.
- Field test analysis methods shall be conducted in accordance with the equipment manufacturer instructions. In particular, the calibration of field pH/EC meter shall be conducted prior to sampling, in accordance with manufacturer's instructions and field test kits (total acidity and total alkalinity) will be used in accordance with manufacturer's instructions.

Table 11: Proposed Water Quality Monitoring Programme

Monitoring Purpose	Monitoring Site Type	Monitoring Site ID	Monitoring Frequency	Parameters	
Dewatering Operation					
Pit dewatering quality	Pit dewatering discharge point	Pit dewatering discharge point	3 times a week (M, W, F) (field)	Field: • pH • Eh • EC • Temperature	• Total Titratable Acidity (TTA) • Total Alkalinity
			Monthly (lab) (or weekly if daily pH_F<4)	Laboratory: • pH • EC • TDS • Total acidity	• Total alkalinity • Chloride • Sulphate • Al (dissolved)* • Fe (dissolved) • Mn (dissolved)
Superficial aquifer water quality	Superficial monitoring bores	Local: YA_MB01S to YA_MB12S TS012M, SCPD28A, SCPD29A	Monthly (field)	Field: • pH • Eh • EC	• Temp • TTA • Total Alkalinity
			Monthly (lab) (or weekly if pH_F<4)	Laboratory: • pH • EC • TDS • Total acidity • Total alkalinity	• Sodium • Chloride • Sulphate • Al (dissolved)* • Fe (dissolved) • Mn (dissolved)
		Local YA_MB08S, YA_MB11S, YA_MB12S and SCPD28A	Six-monthly (lab)	• Total Al • Total As • Total Cd • Total Cr • Total Co • Total Cu • Total Fe	• Total Hg • Total Ni • Total Se • Total Tl • Total U • Total Zn • Ra226 • Ra228
		Regional: YA_MB18_W	Quarterly (field) (Sept/Dec/March/ June)	Field: • pH • EC	• Temp • TTA
			Quarterly (lab) (or weekly if pH_F<4)	Laboratory: • pH • EC • TDS • Total acidity • Total alkalinity	• Sodium • Chloride • Sulphate • Al (dissolved)* • Fe (dissolved) • Mn (dissolved)

*- if dissolved Al > 1 mg/L then additional analyses are required for Zn, Cr, Cu, Mg, Ni, Cd, Se, As, Pb and Hg.

Table 11: (Cont.): Proposed Water Quality Monitoring Programme

Monitoring Purpose	Monitoring Site Type	Monitoring Site ID	Monitoring Frequency	Parameters	
Dewatering Operation					
Leederville water quality	Leederville monitoring bores	YA_MB21_W, YA_MB22_L, YA_MB23_L, YA_MB25_L, YA_MB27_L, YA_MB28_W, YA_MB29_W, YA_MB31_L, YA_MB32_L	Quarterly (field) (Sept/Dec/March/ June)	Field: • pH • Eh • EC	• Temp • TTA • Total Alkalinity
			Quarterly (lab) (or weekly if daily pH_F<4)	Laboratory: • pH • EC • TDS • Total acidity • Total alkalinity	• Sodium • Chloride • Sulphate • Al (dissolved)* • Fe (dissolved) • Mn (dissolved)
Process Water Dam water quality	Surface water sampling location	PWD sampling point	3 times a week (M, W, F) (field)	Field: • pH • EC	• TTA • Total Alkalinity
			Monthly (lab)	Laboratory: • pH • EC • TDS • Total acidity • Total alkalinity • Sodium	• Chloride • Sulphate • Total Al • Total Fe • Al (dissolved)* • Fe (dissolved) • Mn (dissolved)
			Quarterly (lab) (or weekly if daily pH_F<4)	Laboratory: • pH • EC • TDS • Total acidity • Total alkalinity	• Sodium • Chloride • Sulphate • Al (dissolved)* • Fe (dissolved) • Mn (dissolved)
			Six-monthly (lab)	• Total Al • Total As • Total Cd • Total Cr • Total Co • Total Cu • Total Fe	• Total Hg • Total Ni • Total Se • Total Tl • Total U • Total Zn • Ra226 • Ra228
Off-site Discharge water quality	Surface water sampling location	Proposed "Licenced Discharge Point" and "Proposed Emergency Discharge Point"	On the first day of discharge then three times per week during discharge	Field: • pH • EC	• TTA • TSS
			On the first day of discharge then monthly during discharge	Laboratory: • pH • EC • TSS • TDS • Total acidity • Total alkalinity	• Sodium • Chloride • Sulphate • Al (dissolved)* • Fe (dissolved) • Mn (dissolved)

*- if dissolved Al > 1 mg/L then additional analyses are required for Zn, Cr, Cu, Mg, Ni, Cd, Se, As, Pb and Hg.

Table 11: (Cont.): Proposed Water Quality Monitoring Programme

Monitoring Purpose	Monitoring Site Type	Monitoring Site ID	Monitoring Frequency	Parameters	
Dewatering Operation					
Surface water quality	Surface water sampling location	YALSW01 to YALSW14 Proposed YALSW15	Monthly when flowing	Field: • pH • EC	
				Laboratory: • pH • EC • TDS • TSS	• Total acidity • Sulphate
Water Supply Operation					
Yarragadee aquifer water quality	Production Bore	Yarragadee Production Bore YA_PB01	Monthly (field)	Field: • pH	• EC
			Six-monthly (lab)	Laboratory: • pH • EC • TDS • Total acidity • Total alkalinity • Total hardness • Calcium • Sodium • Magnesium • Potassium	• Chloride • Sulphate • Ammonia • Phosphate • Carbonate • Bicarbonate • Nitrate • Silica • Aluminium • Iron • Manganese

*- if dissolved Al > 1 mg/L then additional analyses are required for Zn, Cr, Cu, Mg, Ni, Cd, Se, As, Pb and Hg.

5.4 Trigger Levels

5.4.1 Dewatering Abstraction Trigger Levels

To prevent the exceedance of the Superficial aquifer annual allocation limit, a warning trigger level has been set when the cumulative abstraction reaches 80% of the annual allocation limit.

On any exceedance of a warning dewatering abstraction trigger value, Doral will conduct an internal review to determine the cause of the warning trigger breach.

5.4.2 Water Level Trigger Values

Doral installed additional five Superficial monitoring bores (YA_MB33_GDE to YA_MB37_GDE, refer to Table 7) prior to commencement of mining, adjacent to the environmental sensitive area (i.e. McGibbon Track), where potential direct and/or indirect impacts to vegetation from the Yalyalup dewatering operations have been identified. According to the GDE Management Plan (AQ2, 2020c), the following trigger-response mechanism will be used:

- The commencement of dewatering adjacent to the McGibbon Track will trigger increased groundwater monitoring frequency (from monthly to weekly);
- If groundwater levels fall below the average low annual measured water level (i.e. below the typical autumn groundwater level), then there is a risk water levels will fall below the root zone and water stress and / or hydraulic failure may occur from the inability of root systems to respond to changing hydrological regime. This will trigger increased monitoring frequency of vegetation. With respect to groundwater levels:
    - If total groundwater level decline subsequently reaches 0.25 m below the average low annual measured water level (i.e. below the typical autumn groundwater level), then supplementation will be triggered.
    - If the rate of decline continues at more than 1.5 cm per week, then supplementation will be triggered.

No water level trigger values have been set at the other monitoring bores outside the McGibbon Track area. However, the extent of dewatering impacts will be regularly monitored (as per Table 10), with results reviewed on a monthly basis.

5.5 Water Chemistry Trigger Values

5.5.1 Pit Dewatering

Pit dewatering water (i.e. dewatering effluent) default trigger values have been defined by the DER (2015) and are provided in Table 12.

Table 12: Pit Dewatering Water Chemistry Default Trigger Values

Pit Dewatering Water Parameter	Trigger Criteria
pH*	<5.5
Chloride: Sulphate ratio, or Sulphate: Chloride ratio#	<2, or >0.5
TTA	>40 mg$CaCO_3$/L
Total alkalinity	<30 mg$CaCO_3$/L
Dissolved Aluminum#	>1 mg/L

* values were taken from the DER ASS guideline (DER, 2015);
# values as advised by Regional DWER

Should any of these criteria be triggered, dewatering effluent will be treated via the addition of a suitable neutralising agent prior to re-infiltration (i.e. hydraulic return of sand tails and/or clay fines into mine void). The DWER will be notified within 14 days of a sustained specified trigger exceedance along with the short-term actions taken and proposed long-term management actions.

If dissolved Al concentration exceeds 1 mg/L for any laboratory test, then the sample must be analysed further for As, Cd, Cr, Cu, Pb, Hg, Ni, Se and Zn.

If total alkalinity$_{FIELD}$ (as $CaCO_3$) <30mg/L, Doral will review the data available to determine whether there is a Downward trend in total alkalinity and pH or a corresponding upward trend in filtered Al, Fe, Mn and SO_4.

5.5.2 PWD Water

PWD water default trigger values have been defined by ABEC Environmental (2019) and are provided in Table 13.

Table 13: PWD Water Chemistry Default Trigger Values

PWD Water Parameter	Trigger Criteria
pH	<5.5
TTA	>40 mg$CaCO_3$/L
Total alkalinity	<30 mg$CaCO_3$/L
Dissolved Aluminum#	>1 mg/L

In the event that the water within the process water dam exceeds the trigger values, contingency actions specified in Section 6 will be effected.

If dissolved Al concentration exceeds 1 mg/L for any laboratory test, then the sample must be analysed further for As, Cd, Cr, Cu, Pb, Hg, Ni, Se and Zn.

5.5.3 Groundwater

Groundwater water quality default trigger values have been advised by Regional DWER Office and are provided in Appendix 1.

Groundwater chemistry site-specific trigger values have been developed for each of the Superficial aquifer groundwater monitoring bores, by comparing baseline data to DWER guideline values as advised by regional DWER office. The bore specific chemical triggers have been determined using background data and were based on the mean +/- 2x standard deviations of the background set and are provided in Appendix 1.

If any trigger level is exceeded, contingency actions specified in Section 6 will be actioned and the DWER will be notified within 14 days of a sustained trigger exceedance, along with the short-term actions taken and long term actions proposed to manage the breach.

If dissolved Al concentration exceeds 1 mg/L for any laboratory test, then the sample must be analysed further for As, Cd, Cr, Cu, Pb, Hg, Ni, Se and Zn.

5.5.4 Off-Site Discharge Water

Trigger values for the discharge water sent off-site, will be set in accordance with the DWER discharge licence conditions, when granted however are likely to be:

- pH - 5.5 – 9.0
- TSS – 80 mg/L
- TDS – 2,500 mg/L
- TTA – 40 mg/L.

5.6 Other Monitoring

Monitoring of the GDE vegetation health condition and leaf water potential will be undertaken separately as per the GDE Management Plan (AQ2, 2020c) and will not normally form part of the annual aquifer review, unless adverse impacts to the GDE vegetation as a result of dewatering, are detected.

5.7 Groundwater Model Verification

To improve the future performance of the groundwater model, validation of the groundwater model will be completed after 6 months and again after 12 months of mining operations, when a considerable stress has been imposed on the aquifer system, and in preparation for the potential drawdown effects of the McGibbon Track, where sensitive GDE vegetation has been identified.

Model validation will involve:

- Including the mining progression and water supply pumping in the model;
- Comparing the modelled water level response to observed water levels across the project area;
- Comparing measured and modelled inflows to mining area.

This validation process may indicate that some changes in groundwater model parameters are required to match the observed responses to dewatering and water supply pumping and to match the measured groundwater inflows. As identified, and if required, this shall be incorporated into the drawdown mitigation controls in the vicinity of the McGibbon Track, whilst model predictions can be re-run with the updated or re-calibrated model. This validation process would mean that the groundwater model was calibrated to operational data and the types of stresses associated with actual dewatering.

6 Contingency Plan

The contingency plan has been identified to mitigate potential impacts caused by the Yalyalup mineral sands project.

Doral will notify the DWER South West Region within 14 days of becoming aware that the events listed below have occurred and advise the DWER of the action undertaken, or the proposed course of action. The events include:

- a meter malfunction;
- monthly extraction volumes indicate there is potential for the GWL annual allocation to be exceeded;
- a sustained chemistry or water level action trigger level is reached;
- a justified concern regarding unacceptable impacts is received from a neighbour or the general public.

The course of action will address the event to the satisfaction of the DWER and may include, but is not limited to those actions outlined below.

6.1 Operating Scheme

Doral will maintain all meters in working order by checking their operation on a minimum monthly basis. In the event of the malfunction of a water meter, Doral will ensure that a spare meter is available for replacement.

Doral will conduct ongoing water efficiency assessments, to investigate methods of reducing water demand.

Contingency plans related to the pumping operations are primarily directed towards the prevention and containment of the spillage or leakage of water from the Yalyalup mine and include the following:

- Any minor pipeline leaks will be controlled by temporary bunding and the pipeline will be repaired as soon as possible;
- If a major leak occurs, the abstraction and transfer pumps will be shut down, until repairs are completed;
- If a failure occurs, the pipeline system will be shut down until changes are made to ensure that the risk of a further failure is minimised.

6.2 Dewatering

In the event that dewatering extraction is likely to exceed 80% of the annual Superficial aquifer licence entitlement, Doral will, in first instance, investigate changes to pumping or mining schedules to reduce dewatering rates. An internal review to determine the cause of the breach of the warning level will be undertaken. If the review indicates the potential for the annual allocation limit to be exceeded, DWER will be notified along with the short-term actions taken and discussions held to make an amendment to the annual allocation limit to be increased.

6.2.1 Pit Dewater Effluent

In the event that water quality monitoring of the dewatering effluent reaches any ASS trigger values (as a warning of any oxidation of sulphidic material on site), Doral will undertake the following mitigation measures;

- Increase the monitoring listed in Table 11 to daily field testing and weekly laboratory testing of the affected areas.
- Commence neutralization treatment (liming) of the pit dewater. This is achieved by direct addition of lime to the dewater sumps and/or the more effective method of addition of lime sand to the plant feed. Adding lime to the ore feed acts to effectively neutralize the water circuit through the plant and return neutralising lime sand in the sand tails and neutralized tails return water to the recirculating pit dewatering sumps.

Following a review of the mine schedule, additional contingencies that may be implemented include:

- Mining activities will be scheduled to be undertaken on a campaign basis, with a portion of the ore body being mined and processed in a discrete time period, to assist in minimising the area of groundwater drawdown at any one time;
- Topsoil/subsoil will be stripped to a depth of ~100 mm, stockpiled for rehabilitation and neutralised if pH is <4.0.
- Mitigate the effect of dewatering activities by accelerating backfill of the pit in the affected area to reduce the amount of time PASS horizons are exposed.

6.2.2 PWD Water

In the event that water quality monitoring of the PWD water reaches any ASS trigger values (as per Table 13), the initial contingency measure will be to treat the process water through the addition of a suitable alkaline material to the ore feed and/or the tails return water sump, until the water is above the trigger values. Whilst the PWD is above of the trigger values, discharge of process water off site will cease.

6.2.3 SEPs

In the event that there is a long-term change in Superficial groundwater levels and chemical composition of water evident, an assessment of monitoring data shall be undertaken, to determine if the changes are potentially caused by deposition of tailings into SEPs during mining. If necessary, shallow bore(s) downstream and adjacent to SEPs may be required to reduce size of groundwater mound and remove contaminated water.

6.2.4 Groundwater

In the event that sustained trend of the chemical trigger values listed in Tables 14 and 15 has been exceeded in any of the groundwater monitoring bores, an investigation shall be undertaken, in particular with regards to the potential for ASS site contamination. If necessary, the following contingency measures will be implemented.

The initial response to the exceedance of any trigger values will be:

- Establish the context of the exceedance and determine whether the result requires re-sampling/analysis, immediate action, or no response at all. A key measure for the context of an exceedance is to consider whether multiple triggers are exceeded.
- Review exceedance in relation to any site wide changes or trends in key ASS risk parameter (pH, TTA);
- Review sample collection, handling and analysis methods and procedures, to ensure appropriate methods were used;
- Review groundwater level data, dewatering effluent quality data and current mining operations, to consider possible causal factors;
- If necessary, re-sample affected locations as soon as practical (i.e. within 2-weeks) to confirm whether or not the groundwater quality parameter(s) exceed the trigger value.
- Increase on-going water quality monitoring frequency of the affected bore or bores.

Secondary responses will be developed based upon situation specific outcomes from the initial responses, but will include the following immediate further action responses:

- If it is confirmed that the pH and TTA exceed trigger criteria in successive sampling events, the sampling frequency for field parameters will be increased to fortnightly; and/or
- When it is confirmed that any other groundwater quality parameters have deteriorated to levels outside of the background-based trigger levels; then
    - Inform the DWER that contingency monitoring is being undertaken; and
    - Prepare a contingency action plan suited to the level of risk that confirmed adverse groundwater quality poses to potential receiving environments, such as Down gradient groundwater users or environmental receptors.

6.3 GDE along McGibbon Track

In the event that any of the hydrological triggers (i.e. absolute or rate-of-change triggers in groundwater levels) or vegetation triggers (i.e vegetation health parameters or vegetation water status) has been exceeded, Doral will implement the management response adopted in the GDE Management Plan (AQ2, 2020c).

The management response will comprise two tiers:

- Increased monitoring - The start of operational dewatering or the exceedance of some hydrological triggers will require more frequent monitoring of ecophysiological parameters;
- Water supplementation - Indications of water stress or exceedance of some hydrological parameters will require water supplementation.

Final design for the supplementation scheme will be completed during implementation of this GDE Management Plan. Supplementation will be based on a combination of:

- Surface irrigation.
- Subsurface irrigation in proximity to the groundwater table through either trenches or slotted pipe or shallow spear-points.

At all times great care would need to be taken to prevent overland flow of water, and to minimise wetting of the vegetation itself as a hygiene measure. The supplementation water (i.e. water of sufficient quality) will be sourced from Doral's Yarragadee aquifer production bore only, with no anticipated impact on the Yarragadee licence allocation. Any PWD water or pit dewatering groundwater will not be used during the supplementation scheme process. The volume of water used for the supplementation will be accounted for by the totalising flow meter installed at the production bore prior to being piped to the location for irrigation.

6.4 Other Users

If a concern is raised from another local landowner regarding potential impacts to water supplies or vegetation due to mining activities, Doral will undertake an assessment of the monitoring data from nearby monitoring bores, to further determine the cause of impact and if deemed to be mine related, the DWER will be advised on the outcome of the review and proposed course of action as soon as is reasonably available or otherwise within 14 days of the trigger level being reached or concern being raised.

If other aquifer users experience a reduction in their water supply or the productivity of pasture/horticulture due to mine dewatering, contingency actions may include 'making good' supplies to neighbours (e.g. providing access to an alternative source of water of similar quality and quantity to meet usage requirements, dam supplementation; reticulation; hay supplies, etc.).

Should the investigation into a reported reduction in supply determine that Doral's operation is having an impact on a neighbour's water supply, Doral will put in place interim measures as soon as practical and inform the DWER of the interim actions taken and proposed actions for the future.

6.5 Water Supply

In the event of the identified malfunction of a water meter on the production bore, pumping from the Yarragadee production bore YA_PB01 will be suspended until the meter is either repaired or replaced.

The abstraction from the Yarragadee aquifer is not expected to impact on the environment. However, in the event that the abstraction is shown to have a detrimental effect on the environment, pumping will be reduced from the Yarragadee aquifer until a solution is found.

In the event of a bore or pump failing for the Yarragadee production bore, an investigation will be undertaken to identify an additional (alternative) option to supply sufficient water for ore processing (e.g. development of an additional Yarragadee production bore, if required).

6.6 Off-Site Water Discharge

In the event that the mine's excess water does not meet the water quality criteria (as per DER licence conditions), off-site water discharging during the emergency discharge events will cease as far as is practicable, until measures are implemented to improve the water quality.

7 Water Use Efficiency

Doral will make every effort to maximise water recycling and to minimise water use. Process water will, in the first instance, be sourced from recycled water and dewatering of the pits. Additional process water sourced from the Yarragadee aquifer bore will only be used after other resources have been fully utilised (i.e. PWD /DOD water storage falls below nominal 10,000 m^3, approximately 17% of the total capacity of PWD/DOD). Water will not intentionally be discharged offsite when it cannot be used for any other purposes.

The delivery system for groundwater pumped will be designed using best practice methods to minimise the likelihood of uncontrolled water loss.

The application of water for dust suppression will be carefully controlled to prevent runoff or over-spray.

Doral will continually attempt to improve water use efficiency as part of the ongoing water management programme (e.g. conducting water efficiency assessments to investigate methods of reducing water demand).

8 Summary of Commitments

The monitoring and other commitments proposed in this GWOS are summarised in Table 14.

Table 14: Summary List of Commitments

Relevant Section	No.	Commitment
Administrative Requirements	1	The groundwater Operating Strategy (GWOS) will apply for the life of the groundwater well licences and the life of any licence renewals
	2	Any changes to the conditions / commitments of the GWOS that are required during the period of the GWOS must be agreed by the licensee and DWER with the signatures of both parties on an GWOS Addendum.
	3	Any reportable breach of this GWOS will be reported to the DWER as soon as reasonably practicable from the time of the identification of the breach and recorded in the annual report.
	4	A Groundwater Monitoring Summary (GMS) report will be prepared each year, covering monitoring data recorded during the water year from 1 January to 31 December, and submitted to the DWER Bunbury office within three months of the close of the water year, i.e. by 31 March each year
	5	A Groundwater Monitoring Review (GMR) report will be prepared every three years by a qualified hydrogeologist in accordance with guidelines in DWER Operational Policy 5.12 Hydrogeological reporting associated with a Groundwater Well Licence. The review will provide a complete history of groundwater monitoring over the life of the mine, including a detailed analysis of the aquifer response to groundwater abstraction, comparison with modelled predictions and effects on surface water from its use. The GMR will be submitted to the DWER Bunbury office by 31 March of the year it is due
Operating Rules	6	Doral will ensure that the schedule of production bore use and a table of monitoring bore details will be kept up to date
	7	The DWER will be notified of any bore alterations or additions that are made.
	8	The abstraction from the Superficial aquifer shall not exceed 750,000 kL/year
	9	The abstraction from the Yarragadee aquifer shall not exceed 1,600,000 kL/year
	10	The volume of water taken under the Superficial and Yarragadee licences will be metered using suitable flow meters to meet licence requirements, with meters installed in accordance with the provisions of the document "Guidelines for water meter installation" (DWER, 2009). The accuracy of the installed meters will be maintained within plus or minus 5% of the volume metered, in field conditions
	11	Should more than one active mine pit be dewatered at any one time, then each pit's dewatering pipeline will be metered separately by a suitable meter, before discharge to the drop-out pond
	12	The Yarragadee production bore will be equipped with an electric submersible pump with suitable operational protection (e.g. low-flow and high-temperature cut-off switches). The bore will be operated according to water demand, with no set abstraction schedule
	13	A totalising flow meter will be installed at the Yarragadee production bore to measure abstraction volumes, with monthly recording of volumes.
	14	The recommended pumping rate for the Yarragadee production bore, as set after the aquifer testing, shall not be exceeded
	15	The Yarragadee production bore will be checked regularly by maintenance staff to ensure the bore and flow meter are operating satisfactorily.
	16	Regular inspection for pipeline water leaks will be carried out by maintenance staff and, when required, repairs will be carried out immediately.
	17	The irrigation of the native vegetation (if required) will be sourced from Doral's Yarragadee production bore only. PWD water or pit dewatering groundwater will not be used during the native vegetation irrigation process.
	18	The volume of water used for the irrigation will be recorded from the totalizing meter installed at the Yarragadee production bore

Table 15 (Cont.): Summary List of Commitments

Relevant Section	No.	Commitment
Operating Rules	19	Surplus water may be made available for emergency services or other special third party use only under arrangement with Doral in circumstances of need. However, it is possible that this supply can only be made available when surplus water is generated during winter rainfall events.
	20	In the event of all water storages being at their full capacities and prolonged heavy rainfall occurs within the pit catchment area, any excess water will have to be discharged offsite via proposed controlled "Licenced Discharge Point"
	21	In extreme cases, a "Proposed Emergency Discharge Point" can be used to discharge water off the mine site
	22	V-notch flow gauge will be installed at the proposed Licensed Discharge Point, and proposed Emergency Discharge Point will be activated manually by pump with flow curves to measure volumes of off-site discharge.
	23	Doral will ensure that the DWER will be notified of any alterations or additions that are made in relation to off-site discharge locations.
	24	Doral will ensure that the DWER will be notified of any alterations or additions that are made in relation to surface water monitoring locations.
Identifying and Managing Impacts	25	If Doral identify a breach of management objectives, due to the groundwater abstraction, they will establish a water management response.
Abstraction Monitoring	26	Doral will undertake and report to DWER on the abstraction monitoring as scheduled in Table 6 of this document
	27	The water meters will be inspected regularly for faults and maintenance will be undertaken as required. Calibration will be carried out according to the manufacturer's specifications. Details of any significant meter maintenance and replacement will be collated throughout the water year and incorporated into the annual monitoring summary
Water Level Monitoring	28	Doral will undertake and report to DWER on the water level monitoring programme as listed in Table 10 of this document
Water Quality Monitoring	29	Doral will undertake and report to DWER on the water quality monitoring programme as listed in Table 11 of this document
Groundwater Model Verification	30	Doral will undertake the validation of the groundwater model, to be completed after 6 months and again after 12 months of mining operations, when a considerable stress has been imposed on the aquifer system. This will be prior to mining near the McGibbon Track, where sensitive GDE vegetation has been identified.
Contingency Plan	31	Doral will notify the DWER South West Region within 14 days of becoming aware that the events listed below have occurred and advise the DWER of the proposed course of action. The events include: • a meter malfunction; • monthly extraction volumes indicate there is potential for the Annual Water Entitlement to be exceeded; • a sustained chemistry or water level action trigger level is reached; • a justified concern regarding unacceptable water impacts is received from a neighbour or the general public. The course of action will address the event and may include, but is not limited to those actions outlined in Section 6 of this report.
Water Use Efficiency	32	Doral will continue to focus on water use efficiency as part of their water management programme.
	33	Doral will make every effort to maximise water recycling and to minimise water use.
	34	The application of water for dust suppression will be carefully controlled to prevent runoff or over-spray.
	35	The delivery system for groundwater pumped will be designed using best practice methods, to minimise the likelihood of uncontrolled water loss.

9 References

AQ2, 2020a. Yalyalup Mineral Sands Operation – Site Water Balance, Project, May 2020.

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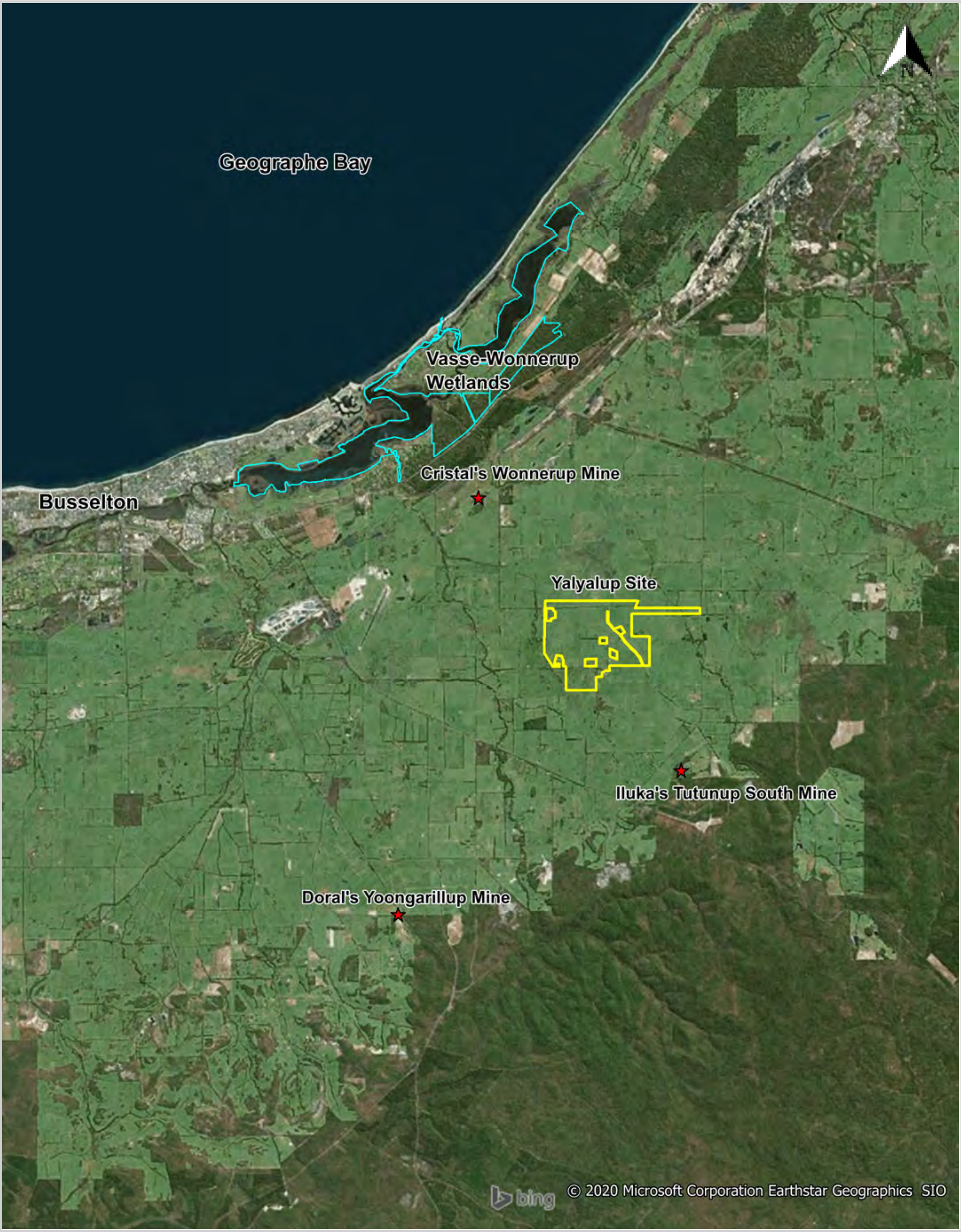
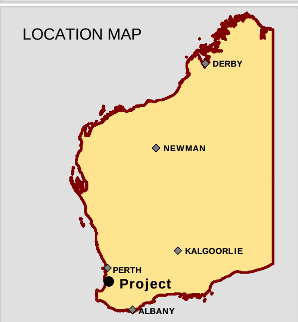
FIGURES





Legend

Proposed Yalyalup Distrubance Boundary

Scale

0 5

kilometres

Scale 1:150,000

AQ2

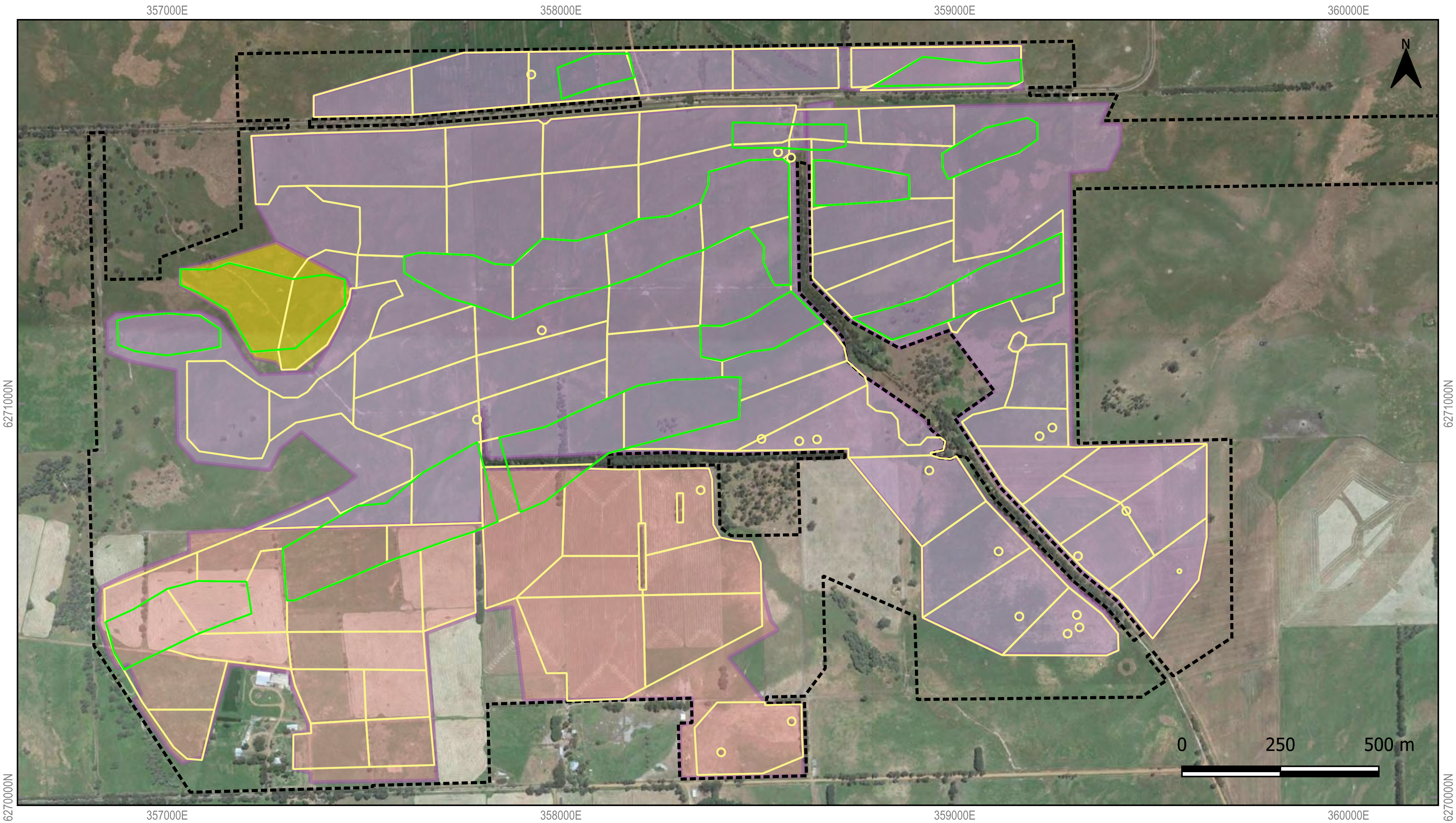
FIGURE 1

REGIONAL LOCATION OF THE YALYALUP MINERAL SANDS PROJECT

AUTHOR:	GC	REPORT NO:	023
DRAWN:	GC	REVISION:	A
DATE:	04/05/20	JOB NO:	136G

NOTES & DATA SOURCES:
Mine outline provided by Doral

Location: F:\136\4.GIS\Workspaces\



Potenital Disturbance Boundary
Shallow Pit Blocks
Deep Pit Blocks

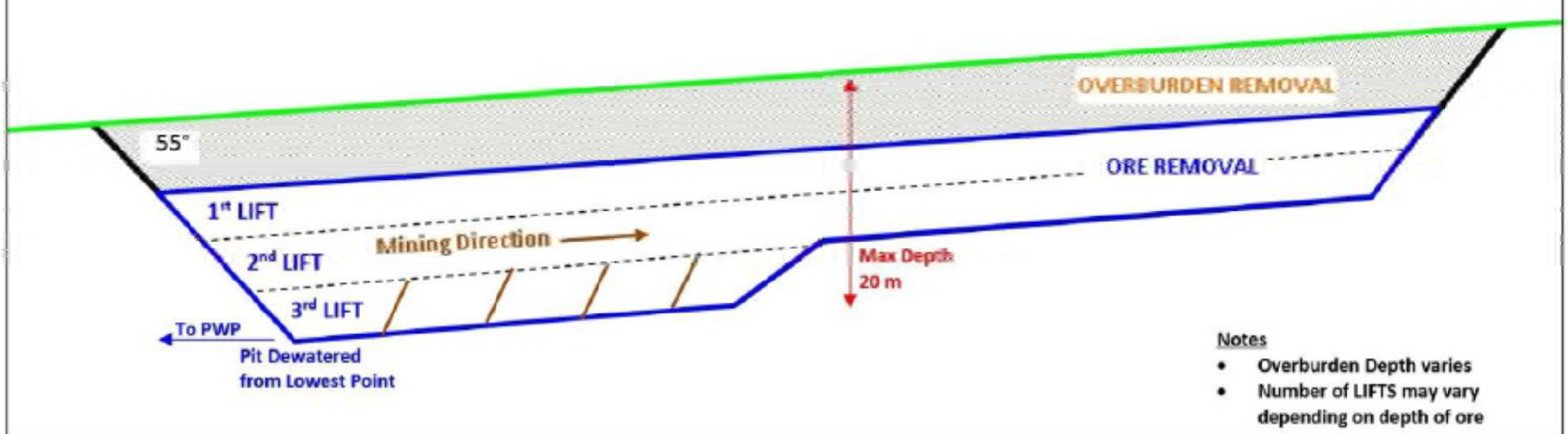
Project Mine Envelope
Stage 1A
Stage 1B
Stage 2

AQ2

Figure 2:

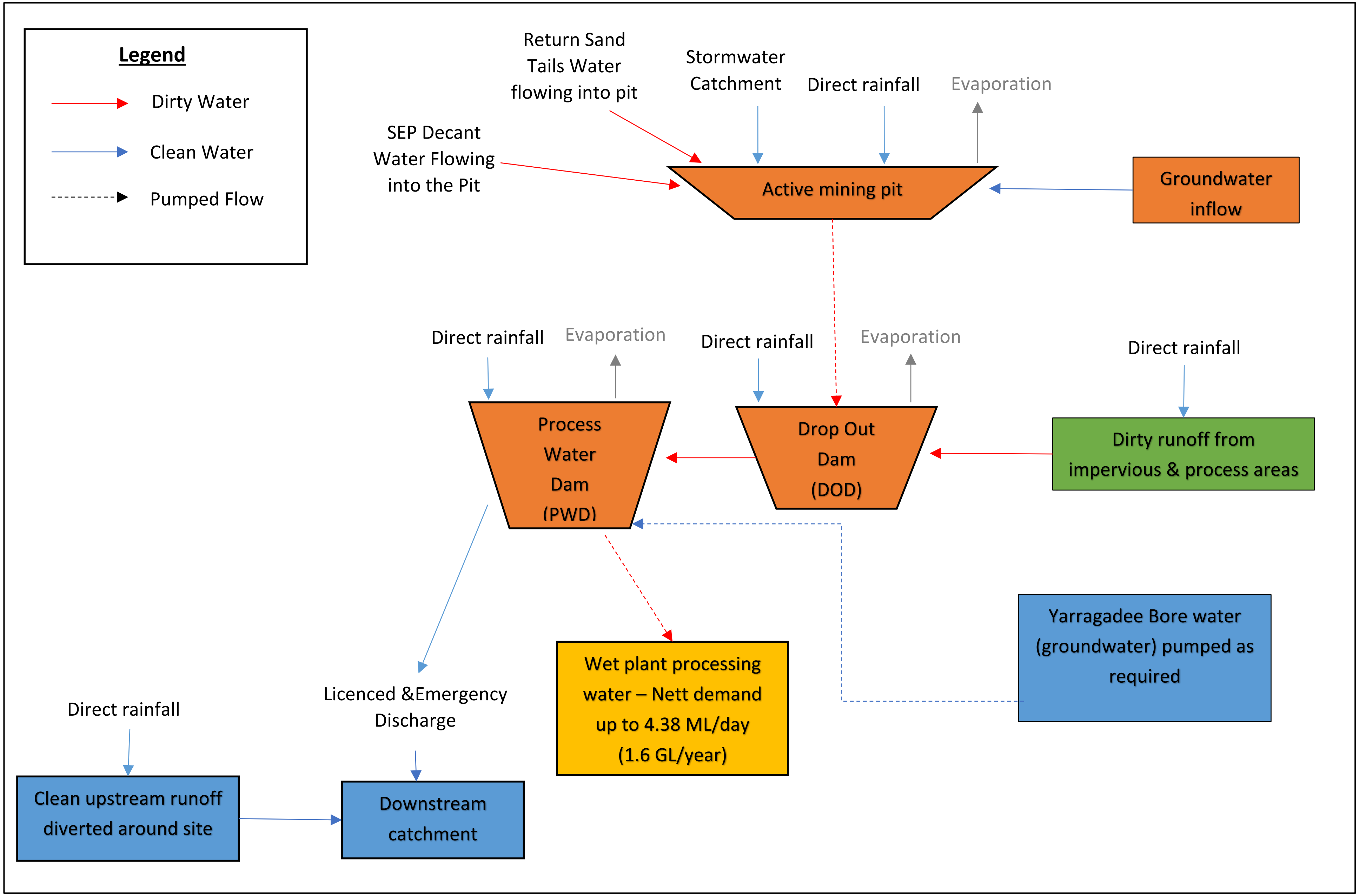
PROPOSED MINE ENVELOPE AT THE YALYALUP SITE

AUTHOR: BDK	REPORT No: 023	Notes and Data Sources:
DRAWN: BDK	JOB No: 136	
DATE: 3/9/2021	Coordinates: MGA94 Zone 50	



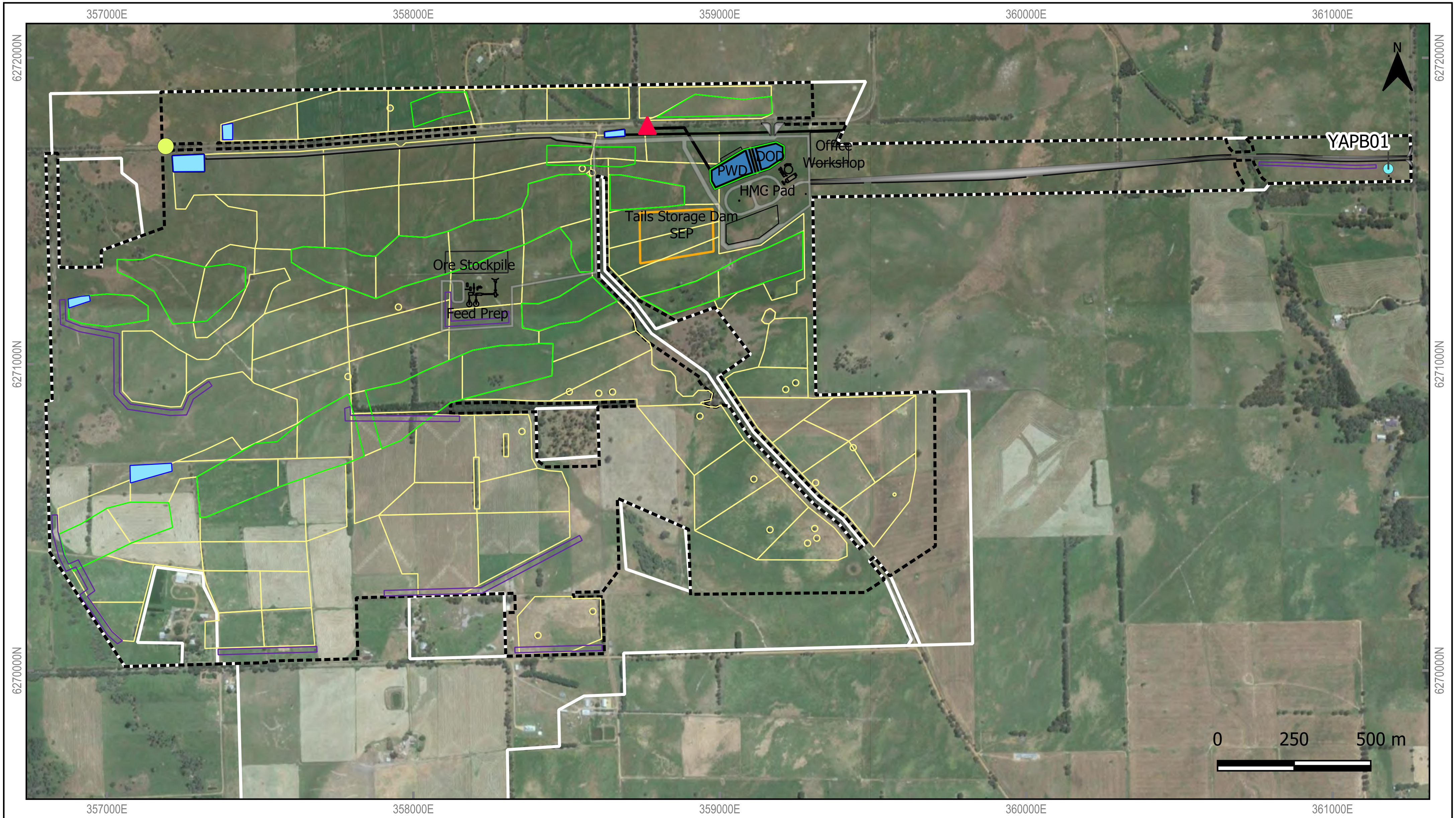
TYPICAL CROSS SECTION – DRAINAGE CONTROL

AUTHOR: BDK DRAWN: BDK DATE: 04/05/20	REPORT NO.: 023 REVISION: A JOB NO.: 136G	NOTES & DATA SOURCES: Figure taken from Plate 3-1 Doral, PER, 2014	FIGURE 3 YALYALUP MINERAL SANDS TYPICAL CROSS SECTION OF DRAINAGE CONTROL



AQ2

WATER BALANCE MODEL SCHEMATIC **FIGURE 4**



F:\136\4.GIS\Workspaces\026a_SWMP\023e Figure 5.qgz

Doral Site Boundary (in white)
Shallow Pit Blocks
Deep Pit Blocks
topsoil bund 4m high
Other Infrastructure
Dams
Licenced Discharge Location
Emergency Discharge Location
Yarragadee Production Bore YAPB01 (with nest of monitoring bores)
Return Water Pond
Roads

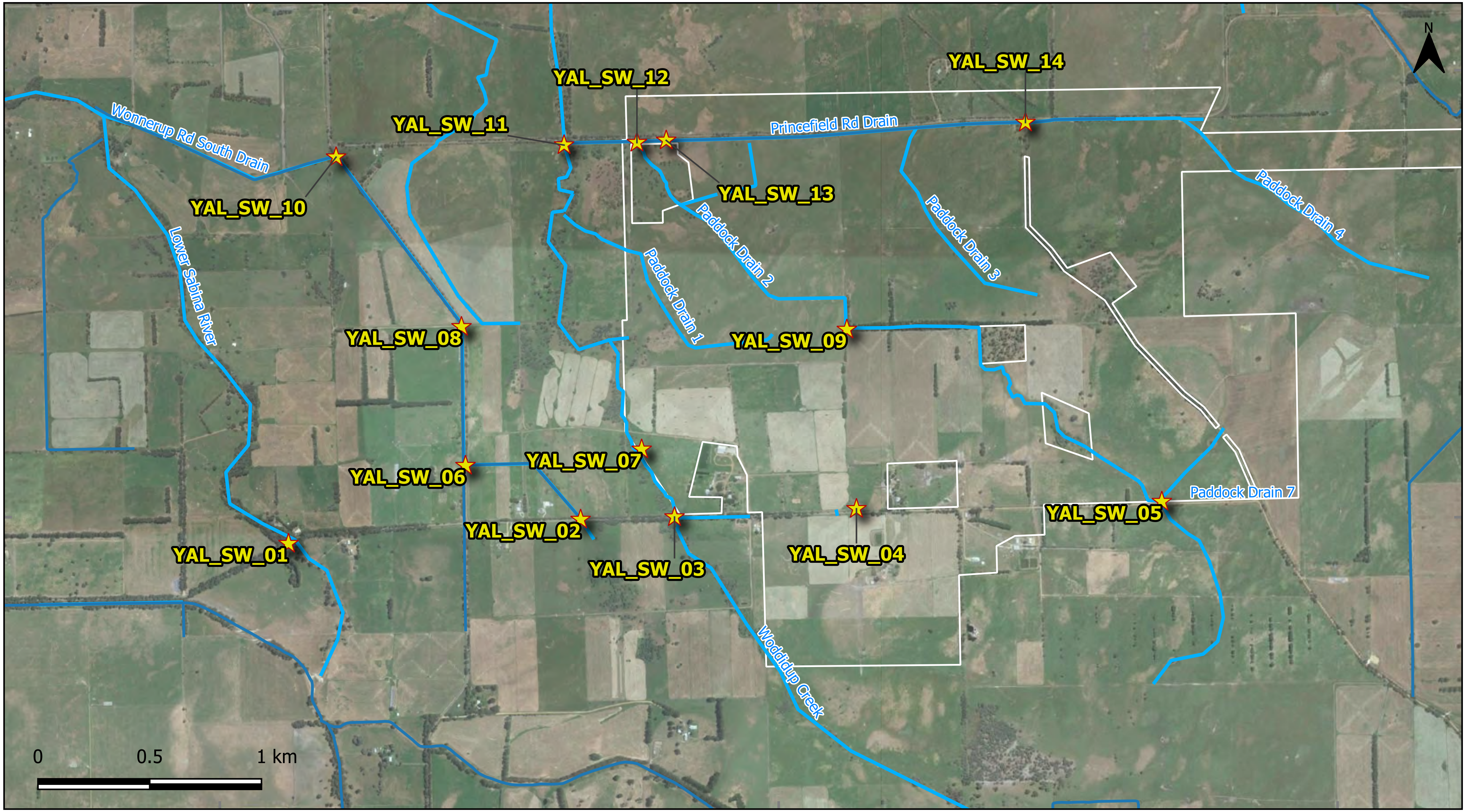
AUTHOR: WM
DRAWN: WM
DATE: 3/5/2021

REPORT No: 026a
JOB No: 136J
Coordinates: MGA94 Zone 50

Notes and Data Sources:
Mine Plan v12 supplied by Doral (2021).
Diversions not shown on Plan, refer to other Report Figures.

Figure 5:

LOCATIONS OF SURFACE WATER DISCHARGE POINTS, YARRAGADEE PRODUCTION BORE AND NESTED MONITORING BORES



Location Map

F:\136\4.GIS\Workspaces\026a_SWMP\023e Figure 6.qgz

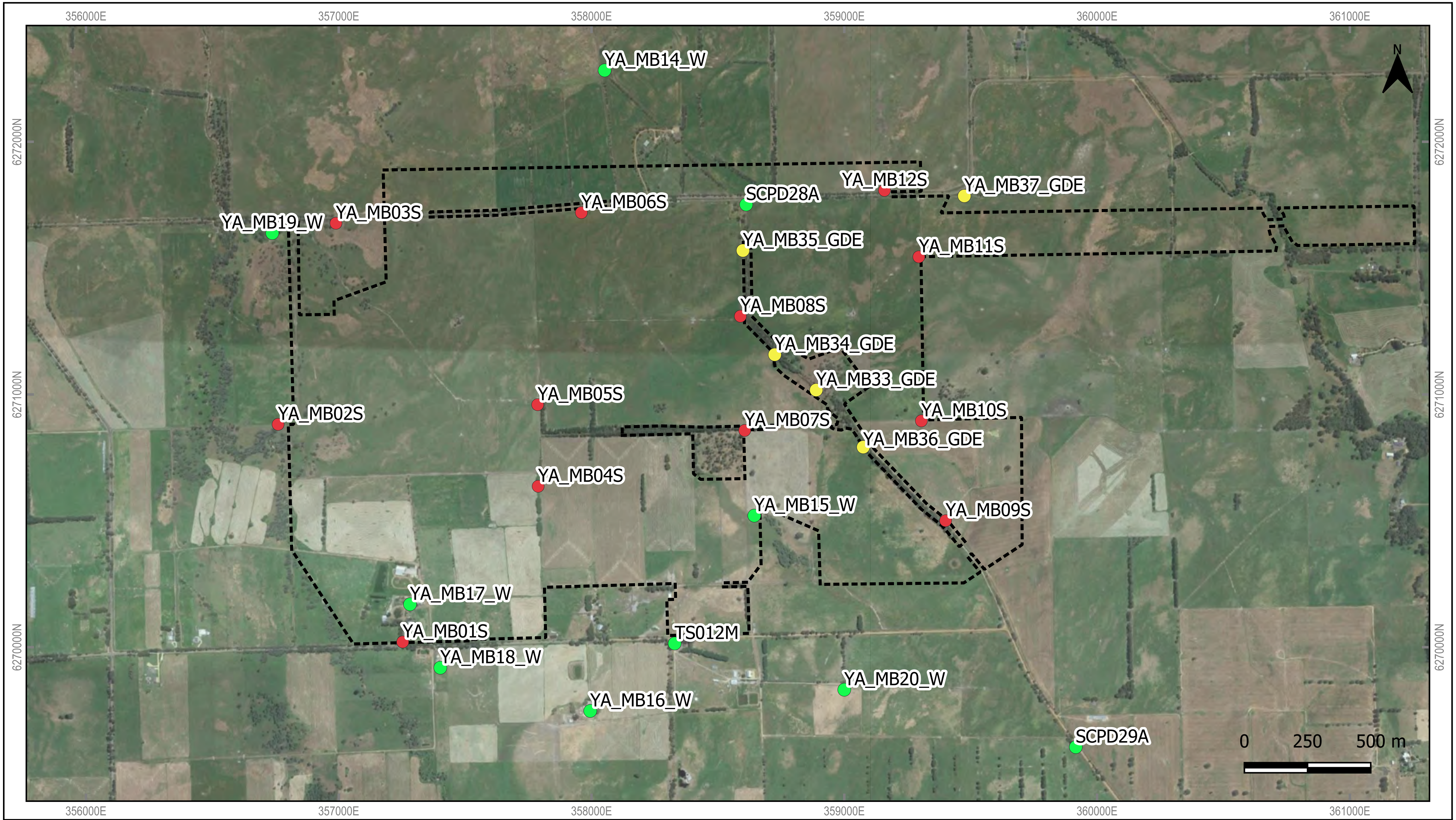
Doral Site Boundary (in white)
Water Corporation Drainage Open Channel
Existing Drainage Line
Surface Water Monitoring Sites

AUTHOR: BDK	REPORT No: 023	Notes and Data Sources:
DRAWN: BDK	JOB No: 136	
DATE: 3/5/2021	Coordinates: MGA94 Zone 50	

AQ2

Figure 6:

LOCAL SURFACE WATER DRAINAGE AND SURFACE WATER MONITORING SITES



Doral Superficial Monitoring Bores

Doral GDE Superficial Monitoring Bores

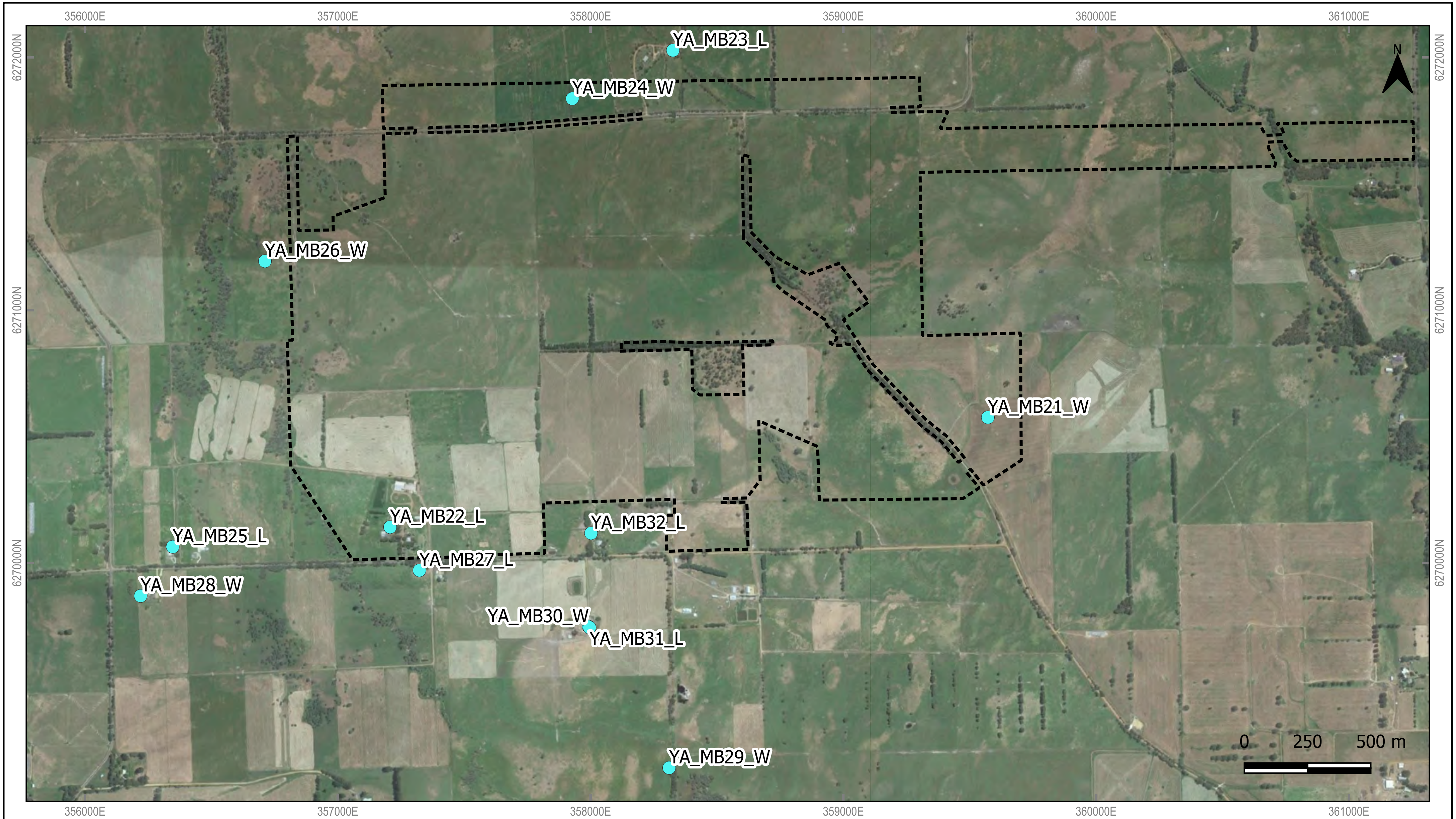
Other Users Superficial Monitoring Bores

Potenital Disturbance Boundary

AUTHOR: BDK	REPORT No: 023	Notes and Data Sources:
DRAWN: BDK	JOB No: 136	
DATE: 3/9/2021	Coordinates: MGA94 Zone 50	

Figure 7:

LOCATION OF SUPERFICIAL AQUIFER GROUNDWATER MONITORING BORES



Location Map

Potenital Disturbance Boundary

Leederville Baseline Monitoring Bores

AUTHOR: BDK

DRAWN: BDK

DATE: 3/9/2021

REPORT No: 023

JOB No: 136

Coordinates: MGA94 Zone 50

Notes and Data Sources:

AQ2

Figure 8:

LOCATION OF LEEDERVILLE AQUIFER GROUNDWATER MONITORING BORES

APPENDIX 1

Appendix 1 Table 1: Groundwater Chemistry Bore Specific Trigger Values

Bore ID	Parameter												
	Field pH	Field Total alkalinity (mg/L)	Sulphate: Chloride ratio	Chloride: Sulphate ratio	Dissolved Aluminum (mg/L)	Field Total acidity (mg/L)	Field Electrical Conductivity (uS/cm)	Total Dissolved Solids (mg/L TDS)	Sulphate (mg/L)	Chloride (mg/L)	Dissolved Iron (mg/L)	Dissolved Manganese (mg/L)
DWER Default Triggers	<5	<10	>0.5	<2	>1	> Any baseline value **PLUS** Cl: SO_4 Ratio **OR** All Trigger						
YA_MB01S	<5	<35.11	>0.5	<0.84	>1	>150.43	>2,306.20	>1,184	>157.20	>576.88	>11.43	>0.32
YA_MB02S	<5	<24.95	>0.5	<2	>1	>221.17	>2,161.99	>1,092.40	>120.06	>569.68	>25.62	>067
YA_MB03S	<5	<39.50	>0.5	<2	>1	>210.95	>2,236.96	>1,086.26	>96.42	>602.45	>29.87	>0.90
YA_MB04S	<5	<25.39	>0.5	<2	>1	>174.79	>1,699.30	>851.70	>44.77	>435.48	>13.04	>0.25
YA_MB05S	<5	<15.06	>0.5	<2	>1	>87.52	>1,096.73	>528.29	>45.42	>248.37	>1.89	>0.06
YA_MB06S	<5	<55.07	>0.5	<2	>1	>69.65	>11,940.73	>7,553.63	>634.46	>3,940.53	>3.64	>0.40
YA_MB07S	<5	<7.78	>0.53	<1.54	>1	>63.22	>521.24	>252.54	>30.27	>95.38	>0.27	>0.02
YA_MB08S	<5	<15.37	>0.5	<2	>1	>56.45	>671.40	>291.03	>39.22	>130.28	>0.47	>0.02
YA_MB09S	<5	<32.72	>0.5	<1.34	>1	>114.71	>3,259.95	>1,638.33	>190.83	>858.47	>1.62	>0.03
YA_MB10S	<5	<23.27	>0.5	<1.22	>1	>99.68	>1,932.48	>1,034.23	>159.93	>598.76	>4.62	>0.03
YA_MB11S	<5	<46.48	>0.5	<2	>1	>129.59	>3,943.12	>2,013.80	>172.19	>1,177.81	>11.11	>0.66
YA_MB12S	<5	<53.64	>0.5	<2	>1	>262.48	>1,994.23	>1,021.12	>58.34	>529.35	>33.94	>1.08
SCPD28A	<5	<42.48	>0.5	<2	>1	>137.34	>4,205.06	>4,078.27	>1,258.72	>1,258.72	>3.18	>0.28
SCPD29A	<5	<26.19	>0.5	<2	>1	>250.90	>1,143.21	>535.07	>30.30	>274.71	>7.93	>0.15
TS012M	<5	<41.66	>0.64	<0.75	>1	>268.64	>2,375.82	>1,310.69	>259.19	>597.36	>22.43	>0.06
YA_MB18_W	<5	<6.99	>0.84	ND#	>1	>133.75	>1,655.55	>896.76	>181.79	>357.70	>0.28	>0.40

ND – not determined due to high variability in the dataset (i.e. values are far from the mean)

Appendix Table 2: Groundwater Chemistry Trigger Criteria

<table>
<tr><th>Groundwater Parameter</th><th>Trigger Criteria</th></tr>
<tr><td>Field pH</td><td><5.0</td></tr>
<tr><td>Field Total alkalinity</td><td><10 $mgCaCO_3/L$</td></tr>
<tr><td>Dissolved Aluminum#</td><td>>1 mg/L
PLUS
Cl: SO_4 Ratio <2
OR
Baseline condition trigger (EC, Total acidity, TDS, SO_4, Cl, Fe or Mn)</td></tr>
<tr><td>Chloride: Sulphate Ratio</td><td><2
PLUS
Dissolved Aluminum >1 mg/L
OR
Baseline condition trigger (EC, Total acidity, TDS, SO_4, Cl, Fe or Mn)</td></tr>
<tr><td>Field Total Acidity</td><td rowspan="7">> Any baseline value (as per Table 15)
PLUS
Cl: SO_4 Ratio
OR
All Trigger</td></tr>
<tr><td>Field Electrical Conductivity</td></tr>
<tr><td>Total Dissolved Solids</td></tr>
<tr><td>Sulphate</td></tr>
<tr><td>Chloride</td></tr>
<tr><td>Dissolved Iron</td></tr>
<tr><td>Dissolved Manganese</td></tr>
</table>

"Management Trigger Response":

If EC, TDS, Chloride, Sulfate, Total acidity Fe and Mn are in excess of the corresponding baseline triggers in conjunction of at least one other trigger. The initial response to the exceedance will be:

- Then samples are re-tested for metals,
- An internal review is undertaken,
- DWER is notified within 14 days of the trigger event results becoming known,
- The frequency of the groundwater monitoring in the triggering bore (s) is to be increased to fortnightly until the analytes return to non-triggering levels or advice is received by DWER that monitoring can return to monthly.

APPENDIX C
MONITORING BORE WATER LEVEL DATA

	YA_MB01S	YA_MB02S	YA_MB03S	YA_MB04S	YA_MB05S	YA_MB06S	YA_MB07S	YA_MB08S	YA_MB09S	YA_MB10S	YA_MB011S	YA_MB012S	YA_MB14_W	YA_MB15_W	YA_MB16_W	YA_MB17_W	YA_MB18_W	YA_MB19_W	YA_MB20_W	YA_MB21_W	YA_MB22_L	YA_MB23_L	YA_MB24_W	YA_MB26_W	YA_MB30_W	YA_MB31_L	YA_MB_33	YA_MB_34	YA_MB_35	YA_MB_36	YA_MB_37	SCPD28A	SCPD29A	TS012M
15/05/2017														22.53	24.15	20.57	21.10	16.09	29.40	28.73	20.89	19.75			17.08	16.98								26.22
15/06/2017													19.85		24.15	20.67	21.23	16.31	29.30	28.79	21.04	19.84	19.13	18.37	18.00	17.75								26.28
15/07/2017													20.05	25.17	24.78	21.21	21.80	17.00	29.92	29.26	21.56	19.86	18.26	18.58	18.72	18.57								26.84
15/08/2017													20.49		25.76	22.74	22.97	18.06	30.45		22.73	20.60	18.81		19.31	19.20								28.04
15/09/2017													20.58		26.06	22.28	22.68	17.21	30.13		22.51	20.60	19.11		19.56									27.90
15/10/2017													20.23	24.92	25.99	22.43	22.58	17.22	29.67	29.62	22.31	20.43	18.53	19.11	19.28	19.14								27.86
15/11/2017													20.13	24.16	25.68	21.95	21.66	16.85	29.43	29.34	21.88	19.24	18.55	18.69	16.94	16.73								27.58
15/12/2017	21.60	18.80		21.46			22.53		28.24	26.98			19.76	23.63	25.42	21.48	21.45	16.60	29.34	29.03	21.47	19.61	18.01	18.41	16.20	16.09								27.23
15/01/2018	21.30	18.99		21.50			22.51		27.88	26.86			19.60	23.24	25.02	21.19	21.43	16.42	29.29	28.88	21.24	19.42	17.79	18.26	15.01	14.82								26.89
15/02/2018	21.07	18.97		21.36			22.42		27.63	26.83			19.40	23.07	24.76	20.93	21.27	16.37	29.27	28.81	21.01	19.48	17.47	18.23	14.46	14.24								26.65
15/03/2018	20.83	18.77		21.25			22.25		27.45	26.77			19.63	22.77	24.44	20.70	21.06	16.20	29.21	28.72	20.82	19.36	17.90	18.04	14.24	14.02								26.40
15/04/2018	20.68	18.63		21.16			22.10		27.33	26.72			19.41	22.55	24.12	20.50	20.87	15.87	29.14	28.66	20.69	19.31	17.49	17.97	15.59	15.31								26.14
15/05/2018	20.63	18.61		21.16			22.00		27.38	26.69			19.24	22.47	23.98	20.48	20.87	15.76	29.12	28.66	20.68	19.49	17.49	18.01	15.96	15.81								26.04
15/06/2018	21.36	20.41		22.28			23.47		27.79	28.02			19.53	25.23	24.77	21.28	21.60	16.99	30.23	29.52	21.60	20.50	17.82	19.12	17.23	17.43								26.96
15/07/2018	22.25	20.24		22.54			24.04		28.98	28.37			20.64	25.17	25.21	22.11	22.30	17.57	30.16	29.93	22.15	19.80	18.81	19.17	18.72	18.61								27.39
1/09/2018	23.08												20.59		26.21	22.90	23.01	17.60	30.17		22.84	20.35	19.12		19.96	19.86						20.81	34.80	27.90
1/10/2018	22.55	19.78		21.98			23.82		29.49	27.60			19.89	24.84	25.94	22.43	22.62	17.28	29.66	29.73	22.35	20.17	18.08	19.05	20.02	19.88						20.30	34.62	28.13
1/11/2018	22.18	19.44		21.75			23.38		29.13	27.36			19.11	24.27	25.62	21.99	22.21	16.79	29.33	29.44	21.94	20.36	18.14	18.72	17.92	17.76						20.06	34.30	27.84
1/12/2018	21.76	19.17		21.51			22.94		28.78	27.11			19.16	23.78	25.32	21.58	21.80	16.50	29.11	29.13	21.59	19.77	17.63	18.37	16.54	16.34						19.86	34.02	27.60
1/01/2019	21.36	18.85		21.37			22.61		28.25	27.00			19.52	23.29	24.85	21.16	21.26	16.22	28.99	28.89	21.16	16.24	17.34	18.14	14.24	12.78						19.71	33.81	27.28
1/02/2019	21.08			21.24			22.38		27.89	26.89			19.47	22.88	24.40	20.91	21.10		28.97	28.73	20.91	16.00	17.65		14.25	14.05						19.65	33.66	26.93
1/03/2019	20.85	18.60		21.19			22.21		27.64	26.83			19.52	22.57	24.03	20.70	20.88	15.78	28.99	28.62	20.77	19.27	17.70	17.92	14.20	14.02						19.65	33.58	26.52
1/04/2019	20.67	18.60		21.12			22.07		27.51	26.74			19.45	22.41	23.76	20.55	20.73	15.64	28.96	28.56	20.62	19.46	17.66	17.83	14.20	14.77						19.53	33.46	26.25
1/05/2019	20.55	18.47		21.07			21.95		27.45	26.70			19.55	22.34	23.57	20.40	20.81	15.57	28.95	28.58	20.60	19.36	17.70	17.86	14.94	16.32						19.55	33.43	26.16
1/06/2019	20.34	18.39	18.76	21.34		21.80	22.00		27.42	26.90	24.69		20.26	22.40	23.61	20.54	20.93	16.12	29.41	28.71	20.84	19.49	18.22	18.52	16.44	17.08						19.89	33.78	25.92
1/07/2019	21.38	18.89		22.36			23.58		28.44	28.00			20.63	25.24	24.70	21.34	21.78	17.29	30.17	29.61	21.61	19.76	18.94	19.17	17.20	18.38						20.91	34.80	26.03
1/08/2019	21.72	20.25		22.15			23.57		28.76	27.63			20.41	25.09	24.85	21.59	21.97	17.16	29.94	29.50	21.80	20.10	18.83	19.12	18.47	18.91						20.51	34.77	26.89
1/09/2019	22.23	20.12		22.44			23.84						20.33	25.19	24.96	22.05	22.19	17.30	29.98		22.14	20.52	18.88	19.17	18.20	17.92						20.75	34.80	27.00
1/10/2019	21.99	20.11	18.05	22.08	21.25	20.52	23.40	20.86	28.75	27.45	23.73	23.24	20.09	24.39	24.88	21.85	21.98	17.03	29.65	29.41	21.94	20.52	18.11	18.97	19.55	19.31						20.41	34.58	27.14
1/11/2019	21.71	19.80	17.82	21.73	21.10	20.39	22.96	20.67	28.43	27.11	23.57	23.07	19.82	23.83	24.60	21.48	21.78	16.71	29.40	29.14	21.59	20.38	17.75	18.57	19.41	17.29						20.10	34.22	27.01
1/12/2019	21.26	19.31	17.50	21.50	20.82	20.14	22.55	20.41	27.92	26.86	23.40	22.89	19.63	23.27	24.33	21.15	21.48	16.41	29.13	28.85	21.20	19.11	17.93	18.32	17.48	15.31						19.83	33.86	26.76
1/01/2020	20.95	18.94	17.36	21.35	20.74	19.99	22.33	20.32	27.59	26.79	23.39	22.85	19.51	22.88	24.04	20.83	21.20	16.08	29.12	28.70	20.92	19.41	17.75	18.05	15.51	15.63						19.70	33.72	26.42
1/02/2020	20.70	18.63	17.26	21.25	20.65	19.83	22.14	20.20	27.34	26.73	23.36	22.81	19.44	22.57	23.79	20.54	21.01	15.75	29.10	28.57	20.71	19.26	17.69	17.92	15.80	14.93						19.60	33.47	26.11
1/03/2020	20.73	18.43	17.06	21.15	20.59	19.70	22.00	20.10	27.21	26.68	23.35	22.80	19.40	22.45	23.51	20.41	20.81	15.59	29.04	28.52	20.62	19.10	17.62	17.71	15.17	13.13						19.51	33.46	25.86
1/04/2020	20.53	18.28	17.01		20.49	19.75	21.67	20.07	27.14	27.08	23.40	22.83	19.49		23.31	20.35	20.76	15.35	28.93		20.50	18.05	17.76	17.39	13.35	13.13						19.64	33.42	25.70
1/05/2020	20.39	18.19	16.64		20.89	19.93	21.49	20.26	26.98	27.28	23.64	22.94	19.93	22.57	23.44	20.38	20.89	15.87	29.31	28.71	20.66	19.36	18.08	18.12	12.98	16.16						19.06	33.29	25.62
1/06/2020	20.66	18.56	17.90		21.05	20.21	22.13	20.35	27.28	26.90	23.79	23.11	20.11	22.75	23.67	20.57	21.10	16.23	29.49	28.87	20.89	19.69	18.33	18.49	16.27	17.48	24.91	22.02	20.76	26.61	23.92	19.96	34.08	25.51
1/07/2020	21.06	18.88	18.52		21.64	20.84	22.92	20.95	27.47	27.45	24.34	23.24	20.60	25.26	24.28	20.99	21.53	16.96	30.15	29.28	21.38	19.95	18.81	19.12	17.58	18.36	25.44	22.59	21.41	27.16	24.37	20.61	34.75	25.84
1/08/2020	22.11	19.87	18.67			21.21	23.79	21.65	28.46	27.76	24.61	23.24	20.64	25.22	24.96	21.93	22.25	17.41	30.10	29.68	22.04	20.35	18.97	19.17	18.46	19.10	25.72	23.34	21.91	27.47	24.55	20.72	34.80	26.34
1/09/2020	22.61	20.25	18.76			21.12	23.94	21.66	28.78	28.14	24.58	23.24	20.65	25.31	25.19	22.47	22.52	17.71	30.46	29.93	22.45	20.57	19.01	19.17	19.19	19.55	25.02	23.56	21.90	27.94	24.13	21.20	34.80	27.04
1/10/2020	22.27	20.48	18.23		21.46	20.78	23.48	21.11	28.68	27.55	23.91	23.19	20.06	24.45	25.11	22.10	22.26	17.14	29.66	29.48	22.10	20.59	18.40	19.04	19.65	19.48	24.94	23.06	21.23	27.23	24.03	20.39	34.67	27.26
1/11/2020	21.97	19.80	17.92		21.20	20.53	23.10	21.24	28.43	27.28	23.68	22.91	19.95	23.96	24.91	21.80	21.97	16.89	29.64	29.26	21.80	20.14	18.31	18.70	19.58	16.80	25.21	22.68	21.00	26.94	23.93	20.13	34.39	27.11
1/12/2020	21.75	19.52	17.74		21.08	20.47	22.93	20.71	28.28	27.21	23.58	22.95	19.84	23.68	24.75	21.57	21.83	16.73	29.40	29.16	21.56	20.04	18.11	18.46	17.00	15.28	24.69	22.54	20.80	26.83	23.69	20.02	34.23	26.91
1/01/2021	21.17	19.21	17.36		20.82	20.18	22.55	20.49	27.82	26.99	23.43	22.78	19.61	23.17	24.23	21.00	21.37	16.36	29.20	28.83	21.00	18.75	17.80	18.03	15.50	12.04	24.45	22.24	20.58	26.48	23.48	19.79	33.91	26.75
1/02/2021	20.91	18.75	17.48	21.49	20.82	20.16	22.36	20.61	27.56	26.89	23.64	22.80	19.80	22.88	23.98	20.75	21.33	15.89	29.29	28.70	20.83	19.52	17.90	18.03	12.30	13.14	24.99	22.14	20.55	26.42	23.68	19.69	33.74	26.34
1/03/2021		18.62	17.48	21.42	20.90	20.12	22.30	20.45	27.54	26.87	23.61	22.70	19.75	22.72	23.71	20.63	21.39	15.93	29.14	28.71	20.69	18.80	17.96	18.07	13.32	13.64	24.61	22.04	20.57	26.31	23.61	19.82	33.84	26.09
1/04/2021		18.52	17.71	21.49	21.03	20.14	22.23	20.58	27.41	26.86	23.71	22.82	19.70	22.63	23.58	20.67	21.00	15.30	29.05	28.62	20.58	19.75	17.67	17.88	13.85	13.92	25.00	22.05	20.78	26.58	23.81	19.92	33.76	26.00
1/05/2021	20.64	18.70	17.89	21.63	21.17	20.26	22.38	20.61	27.58	26.92	23.85	23.10	20.07	22.95	23.62	20.53	21.10	16.16	29.48	28.90	20.82	19.93	18.23	18.36	14.10	15.44	24.94	22.20	20.93	26.62	23.89	20.02	34.05	25.94
1/06/2021	20.86	18.85	18.22	21.98	21.48	20.70	22.84	20.95	27.69	27.27	24.09	23.19	20.60	24.81	24.03	20.83	21.45	16.67	30.02	29.13	21.19	16.66	18.31	18.81	15.58	17.64	25.08	22.61	21.28	26.95	24.12	20.47	34.40	26.01
1/07/2021	21.33	19.25	18.67	22.64		21.28	23.53	21.62	28.28	27.63	24.61	23.24	20.67	25.24	24.35	21.19	21.78	17.16	30.30	29.44	21.55	20.17	18.93	19.17	17.74	18.48	25.63	23.20	21.87	27.48	24.48	20.94	34.80	26.24
31/07/2021	20.86	19.25		22.64			23.53	21.62	28.28	27.63	24.61	23.24		25.24	24.35	21.19	21.78		30.30	29.44	21.55	20.60	18.93		17.74	18.48						20.94		26.67
31/08/2021	22.34		18.83					21.71				23.24	20.67		25.35	22.92	21.84	17.95			22.76		19.15		18.58	19.29								27.73
30/09/2021	22.07		18.68					21.67				23.24	18.81		25.67	22.63	22.81	17.56	30.21		22.59		19.05		19.40	19.68						21.09		27.65
31/10/2021	21.97	21.17	18.27		21.48	20.80	23.83	21.58	29.27	27.79	24.02	23.24	19.12	24.97	25.60	22.57	22.62	17.09	29.95	29.93	22.55		18.63		19.84	19.83	25.11	23.50	21.55	27.43	24.10	20.57		27.52
30/11/2021	21.63	20.00	18.08	22.10	21.38	20.75	23.62	21.25	29.08	27.59	23.82	22.83	18.96	24.62	25.54	22.24	22.58	16.89	29.73	29.58	22.40		18.40	18.87	19.95	19.55	24.98	23.26	21.54	27.38	24.03	20.32		27.44
31/12/2021	21.01	19.67	17.72	21.71	20.95	20.35	23.01	20.70	28.65	27.18	23.48	22.80	18.09	23.91	25.19	21.67	22.00	16.62	29.42	29.18	21.70	20.40	18.08		19.66	17.75	24.60	22.55	20.71	26.76	23.56	19.93		27.10
31/01/2022	21.38	19.17	17.57	21.58	20.84	20.17	22.68	20.56	28.21	26.97	23.51	19.78	19.44	23.28	24.79	21.07	21.66	16.35	29.22	28.89	21.34	19.93	17.92		17.87	16.58	24.48	22.33	20.58	26.71	23.51	19.80	33.97	26.62
28/02/2022	21.02	18.87	17.42	21.47	20.77	19.93	22.50	20.41	27.84	26.78	22.69	20.10	20.08	22.99	24.28	20.85	21.28	15.95	29.07	28.78	21.34	19.38	17.76		16.80	15.59	24.37	22.09	20.39	26.39	22.86	19.63	33.74	26.25
31/03/2022	20.72	18.53	17.40	21.38	20.67	19.85	22.29	20.31	27.57	26.61	22.44	21.59	19.35	22.68	23.87	20.61	21.03	15.74	29.04	28.57	20.96	19.58	17.48		15.83	13.40	24.29	21.89	17.84	26.23	22.64	19.41	33.65	26.02
30/04/2022	20.61	18.40	17.29	21.21	20.54	19.70	22.08	20.12	27.44	26.52	22.61	21.64	19.30	22.43	23.62	20.59	21.02	15.74	29.00	28.51	20.96	16.94	17.50		15.84	16.07	24.37	21.58	18.00	26.12	22.93	19.60	33.53	25.82
31/05/2022	20.49	18.20	17.30	21.17	20.16	19.60	21.91	20.05	27.40	26.49	22.99	22.15	19.40	22.41	23.37	20.72	20.83	15.68	28.98	28.50	20.96	18.90	17.45		16.67	16.69	24.93	21.61	20.47	26.30	22.32	19.43	33.58	25.72
30/06/2022	20.78	18.16	18.25	21.63	20.38	20.33	22.54	20.47	27.44	26.93	23.48	22.56	18.70	25.13	23.93	21.07	21.40	16.35	29.40	29.01	23.79	18.75	17.72		16.41	17.90	24.92	22.24	20.78	26.86	23.69	20.37	34.11	26.08
31/07/2022	21.09	18.89	18.50	21.81	20.56	21.13	22.86	20.89	27.91	27.26	23.82	22.94	20.90	25.33	24.43	21.37	21.58	16.66	29.50	29.83	21.57	18.78	18.05		17.91	18.94	25.55	23.18	21.81	27.75	24.34	21.10	34.29	26.39
31/08/2022	22.86	19.50	18.78		21.04	21.43	24.30	21.61	29.00	28.36	24.24	22.60	20.90	25.53	25.30	22.63	21.80	17.41	29.70	29.49	22.55	19.70	18.65		18.60	19.24	25.10	23.59	21.61	27.63	23.96	20.62	34.80	27.45
20/09/2022	22.79	20.24	18.58		20.86	21.28	23.94	21.67	29.22	27.74	24.54	22.32	20.58	25.51	25.45	22.77	22.15	17.39	29.90	29.93	22.55	20.60	18.25		19.30	19.18	25.01	23.40	21.62	27.46	23.88	20.62	34.80	27.52
20/10/2022	22.21	20.39	18.16	21.65	19.92	20.80	23.42	21.04	28.92	27.98	23.53	22.11	20.44	24.38	25.60	22.78	22.20	17.05	29.98	29.43	22.49	19.61	18.65		19.56	19.24	24.75	22.68	21.25	26.97	23.50	20.42	34.45	27.28
23/11/2022	21.94	19.72	17.96	21.51	19.61	20.75	22.98	20.91	28.70	27.26	23.35	22.09	20.02	24.18	25.48	22.36	22.08	16.73	29.80	29.43	22.37	19.76	18.53		19.66	18.81	24.58	22.35	20.90	26.71	23.27	20.20	34.12	27.07
31/12/2022	21.59	19.34	17.77	21.27	19.68	20.67	22.60	20.63	28.42	27.06	23.27	22.04	18.98	24.11	24.87	21.85	21.57	16.49	29.28	28.93	21.52	19.68	18.45		19.21	17.39	24.44	22.13	20.65	26.56	23.15	20.10	34.08	26.94

APPENDIX D
MONITORING BORE WATER QUALITY DATA

YA_MB01S			Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
Date		Triggers	11/01/2018	12/02/2018	12/03/2018	12/04/2018	8/05/2018	12/06/2018	10/07/2018	9/08/2018	10/09/2018	9/10/2018	7/11/2018	6/12/2018	9/01/2019	7/02/2019	12/03/2019	9/04/2019	7/05/2019	10/06/2019	9/07/2019	8/08/2019	9/09/2019	8/10/2019	7/11/2019	10/12/2019
Casing Height above topo	m		0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Depth of bore	m		5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73
SWL (m)	m (from top of casing)		2.89	3.12	3.36	3.51	3.56	2.83	1.94	0.99	1.11	1.64	2.01	2.43	2.83	3.11	3.34	3.52	3.64	3.85	2.81	2.47	1.96	2.2	2.48	2.93
m AHD			21.30	21.07	20.83	20.68	20.63	21.36	22.25	23.20	23.08	22.55	22.18	21.76	21.36	21.08	20.85	20.67	20.55	20.34	21.38	21.72	22.23	21.99	21.71	21.26
Purge	L		34	31	28	27	26	35	45	57	55	49	45	40	35	31	29	27	25	23	35	39	45	42	39	34
Field pH		<5	5.85	5.88	5.85	5.79	5.75	5.82	5.86	5.85	5.85	5.74	5.6	5.64	5.45	5.75	5.85	5.88	5.89	5.93	5.9	5.8	5.94	5.82	5.92	5.83
Temp	degrees C		19.6	21	22.4	21.3	20	17.4	17.4	14.7	16.9	18.1	17.6	18.2	20.5	21.7	22.4	22.9	20.4	18.4	17.1	15.4	15.3	16.3	16.9	18.3
Field Cond (EC)	uS/cm	>2306.20	2380.00	1880.00	1630.00	1630.00	1660.00	1900.00	1250.00	1350.00	1960.00	2330.00	2490.00	2540.00	2420.00	1630.00	1550.00	1650.00	1540.00	1630.00	1870.00	1580.00	1140.00	1590.00	1750.00	1880.00
Field Salinity	ppm		1190	940	820	820	830	980	620	680	980	1170	1240	1270	1210	820	750	820	770	810	930	790	570	790	880	940
Field ROP	mv		330	318	148	324	337	322	390	361	232	245	290	300	351	234	237	265	324	345	283	298	345	266	358	324
Field Alkalinity		<35.11	72	72	93	54	84	48	42	45	66	57	57	66	59	45	45	60	42	57	57	63	45	54	63	60
Field TTA		>150.43	120	115	100	113	130	95	70	70	85	100	100	115	110	100	100	100	100	110	95	115	100	80	90	120
Field DO %S			8.2	7.7	9.2		9.5	11.8	11.7	13.5	12	12.7	14.5	17.1	16.2	14.9	15.5	15.1	17.2	17.6	16.7	15.9	17.9	18.1	20.4	20.8
Comments																										
Aluminium Filtered (Al)	mg/L	>1	0.024	0.009	0.024	0.018	0.014	0.23	0.048	0.057	0.023	0.028	0.012	0.043	0.009	0.019	0.009	0.017	0.011	0.029	0.017	0.028	0.044	0.022	0.025	0.014
Aluminium Total (Al)	mg/L		1		22			1.4												0.32						
Arsenic (As)	mg/L		0.0001		<0.0001			0.0001												<0.0001						
Arsenic (As) Total	mg/L																									
Boron (B)	mg/L																									
Cadmium (Cd)	mg/L		<0.0001		<0.0001			<0.0001												<0.0001						
Cadmium (Cd) Total	mg/L																									
Chromium (Cr)	mg/L		0.0003		<0.0001			0.0001												<0.0001						
Chromium (Cr) Total	mg/L																									
Chromium VI (Cr)	mg/L																									
Chromium VI (Cr) Total	mg/L																									
Cobolt (Co)	mg/L																									
Cobolt (Co) Total	mg/L																									
Copper (Cu)	mg/L																									
Copper (Cu) Total	mg/L																									
Iron Filtered (Fe)	mg/L	>11.43	0.61	0.83	1.1	1.1	1.2	0.97	0.25	0.1	0.087	0.096	0.14	0.14	0.099	0.16	0.22	0.42	0.6	0.78	4.1	9.1	2.3	3.6	4.7	10
Iron Total (Fe)	mg/L		1.3		14			7.9												0.86						
Lead (Pb)	mg/L																									
Manganese (Mn)	mg/L	>0.32	0.079	0.072	0.082	0.069	0.078	0.063	0.024	0.016	0.056	0.096	0.11	0.1	0.077	0.077	0.046	0.052	0.057	0.067	0.14	0.24	0.084	0.13	0.15	0.26
Magnesium (Mg)	mg/L			43.6		37.8	47		31.3	26.5	47	74.6	82.8	81.7	57.5	42.9	36.6	32.9	38		49.5	34.3	26.4	34.9	41	28.7
Mercury (Hg)	mg/L																									
Mercury (Hg) Total	mg/L																									
Molybdenum (Mo)	mg/L																									
Nickel (Ni)	mg/L		0.0006		<0.0005			0.0006												0.0007						
Nickel (Ni) Total	mg/L																									
Selenium (Se)	mg/L		<0.0002		<0.0002			0.0003												<0.0002						
Selenium (Se) Total	mg/L																									
Uranium (U)	mg/L																									
Uranium (U)Total	mg/L																									
Zinc (Zn)	mg/L		0.007		0.005			0.003												0.007						
Zinc (Zn) Total	mg/L																									
Thallium (Tl)	mg/L																									
Thallium (Tl) Total	mg/L																									
CaCO3 (Acidity)	mg/L		69	52	69	74	63	47	39	54	50	39	56	66	55	38	27	70	38	73	65	86	50	37	82	96
CaCO3 (Alkalinity)	mg/L		59	56	55	52	55	43	39	45	51	54	55	52	54	51	53	53	52	54	43	41	41	43	51	49
Bicarbonate	mg/L			56		52	55		39	45	51	54	55	52	54	51	53	53	52		43	41	41	43	51	49
Calcium	mg/L			27.7		20.9	25.3		17.1	16.2	29.8	44.6	47.8	43.9	32.1	25.9	23.3	21	22.9		24.1	10.8	14.6	17.9	20.4	7.1
Carbonate	mg/L																									
Ammonia (NH3-N)	mg/L		0.015		<0.010			0.015												<0.010						
Nitrogen Total (N)	mg/L		2.6		4.8			3.9												0.63						
Chloride (Cl)	mg/L	>576.88	570	420	350	370	390	460	270	300	440	607	651	673	552	353	336	347	363	398	446	368	238	343	393	433
NATA EC	uS/cm		2110	1750	1550	1540	1620	1760	1090	1190	1760	2160	2480	2460	2250	1470	1350	1410	1480	1540	1750	1450	1060	1370	1550	1560
O2	mg/L		3.2		4.4			3.5												5						
Phosphate as PO4-P	mg/L																									
Phosphorus Total (P)	mg/L		0.02		0.02			0.022												<0.005						
NATA pH			6.1	6.3	6.1	6.1	6.1	6	6.2	6.2	6.2	6.1	6.2	6.1	6.2	6.6	6.6	6.2	6.5	6.2	6.1	6	6.2	6.2	6.3	6
Potassium (K)	mg/L			13.1		10.4	15.2		10.7	10	13.4	24	20.6	20.6	15.3	17.1	17.5	14.9	16.4		14.1	9.2	11.8	12.1	12.6	6.8
Sodium (Na)	mg/L			234		181	207		142	142	196	289	335	325	243	199	188	173	202		233	215	149	189	217	203
Sulphate (SO_4^{2-})	mg/L	>157.20	160	150	120	120	120	110	80	82	130	170	170	150	150	140	100	98	99	110	100	73	64	91	110	56
TDS	mg/L	>1184	1210	992	817	802	855	980	620	635	963	1200	1400	1300	1200	830	830	810	800	790	930	800	600	730	840	810
Sulphate:Chloride Ratio		>0.5	0.28	0.36	0.34	0.32	0.31	0.24	0.30	0.27	0.30	0.28	0.26	0.22	0.27	0.40	0.30	0.28	0.27	0.28	0.22	0.20	0.27	0.27	0.28	0.13
Chloride:Sulphate Ratio		<0.84	3.56	2.80	2.92	3.08	3.25	4.18	3.38	3.66	3.38	3.57	3.83	4.49	3.68	2.52	3.36	3.54	3.67	3.62	4.46	5.04	3.72	3.77	3.57	7.73

YA_MB01S	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
Date	9/01/2020	10/02/2020	9/03/2020	8/04/2020	7/05/2020	8/06/2020	8/07/2020	6/08/2020	7/09/2020	12/10/2020	5/11/2020	7/12/2020	12/01/2021	4/02/2021	16/03/2021	19/04/2021	6/05/2021	3/06/2021	6/07/2021	10/08/2021	6/09/2021	14/10/2021	11/11/2021	14/12/2021
Casing Height above topo	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Depth of bore	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73
SWL (m)	3.24	3.49	3.46	3.66	3.8	3.53	3.13	2.08	1.58	1.92	2.22	2.44	3.02	3.28			3.55	3.33	2.86	1.13	1.4	1.5	1.84	2.46
m AHD	20.95	20.70	20.73	20.53	20.39	20.66	21.06	22.11	22.61	22.27	21.97	21.75	21.17	20.91			20.64	20.86	21.33	23.06	22.79	22.69	22.35	21.73
Purge	15	13	14	12	12	13	16	22	25	23	21	20	16	15			13	15	18	28	26	25	23	20
Field pH	5.87	5.98	5.82	5.7	5.79	5.64	5.9	5.85	5.86	5.85	5.77	5.86	5.92	5.74			5.83	5.83	5.86	6.06	6.02	6.06	5.98	5.93
Temp	18.5	19.3	21.8	20.8	19.4	17.6	16.5	15.4	15.4	15.4	16.1	16.9	18.1	17.5			19.7	17.7	17.9	15.4	17	16.3	17.2	17.9
Field Cond (EC)	1510.00	1460.00	1430.00	1540.00	1590.00	1480.00	1520.00	1260.00	1080.00	1340.00	1540.00	1600.00	1570.00	1460.00			1600	1540	1650	1070	1270	1490	1830	1700
Field Salinity	760	730	710	770	790	740	760	630	540	670	770	800	780	730			800	770	820	540	630	750	910	850
Field ROP	356	344	413	490	426	460	432	441	415	387	441	436	394	447			440	438	438	337	357	356	395	
Field Alkalinity	66	66	51	60	63	33	69	57	51	57	60	57	57	60			75	66	72	48	75	54	42	78
Field TTA	110	110	110	105.000	110	160	135	130	95	110	135	110	140	100			170	130	130	70	60	80	123	152
Field DO %S	20.6	18.8	17.6	17.1	16.2	13.5	16.7	20.1	16.9	13.9	20	15.5	17.8	17.1			16.9							
Comments																								
Aluminium Filtered (Al)	0.011	0.046	0.063	0.030	0.027	0.028	0.037	0.034	0.032	0.029	0.019	0.020	0.015	0.023			0.009	0.017	0.034	0.12	0.035	0.049	0.018	0.026
Aluminium Total (Al)						1.8																		
Arsenic (As)						0.0006																		
Arsenic (As) Total																								
Boron (B)																								
Cadmium (Cd)						<0.0001																		
Cadmium (Cd) Total																								
Chromium (Cr)						<0.0001																		
Chromium (Cr) Total																								
Chromium VI (Cr)																								
Chromium VI (Cr) Total																								
Cobolt (Co)																								
Cobolt (Co) Total																								
Copper (Cu)																								
Copper (Cu) Total																								
Iron Filtered (Fe)	5.7	8.4	5.5	13.000	14	15	11	11	3.4	7.4	9.8	9.500	7.6	6.5			15	8.9	12	0.66	2.2	3.2	9.9	11
Iron Total (Fe)						19																		
Lead (Pb)																								
Manganese (Mn)	0.19	0.23	0.15	0.300	0.31	0.34	0.28	0.26	0.13	0.21	0.25	0.260	0.22	0.21			0.35	0.28	0.31	0.057	0.14	0.23	0.28	0.3
Magnesium (Mg)	35.2	32.9	31.4	32.9	30.9		32.9	29	25.3	31.5	33.1	36.7	28.2	35			32.9							38.5
Mercury (Hg)																								
Mercury (Hg) Total																								
Molybdenum (Mo)																								
Nickel (Ni)						0.0013																		
Nickel (Ni) Total																								
Selenium (Se)						<0.0002																		
Selenium (Se) Total																								
Uranium (U)																								
Uranium (U)Total																								
Zinc (Zn)						0.009																		
Zinc (Zn) Total																								
Thallium (Tl)																								
Thallium (Tl) Total																								
CaCO3 (Acidity)	85	98	71	120	150	130	100	87	67	73	80	86	90	69			130	100	80	34	42	61	67	89
CaCO3 (Alkalinity)	48	62	44	40	61	46	48	41	40	43	45	44	50	81			37	42	58	38	41	45	46	59
Bicarbonate	48	62	44	40	61		48	41	40	43	45	44	50	81			37							59
Calcium	14.8	11.5	13.3	6.4	4.6		8.7	7.3	12.3	13.1	11.1	14.5	8.7	16.3			5.6							13.3
Carbonate																								
Ammonia (NH3-N)						<0.010																		
Nitrogen Total (N)						0.094																		
Chloride (Cl)	368	379	379	418	418	418	401	337	272	343	409	419	413	383			419	393	423	235	289	357	439	436
NATA EC	1450	1410	1420	1440	1510	1480	1470	1250	1050	1300	1480	1550	1500	1430			1500	1500	1520	998	1160	1400	1660	1580
O2						6																		
Phosphate as PO4-P																								
Phosphorus Total (P)						<0.005																		
NATA pH	6.1	6.1	6.1	5.9	6	5.9	5.9	6	6.1	6.1	6	6	6	6.2			5.8	6.1	6.1	6.1	6.7	6.2	6.8	6.1
Potassium (K)	11.6	9.9	10.8	7.1	6.7		8.5	8.3	9.3	9.7	8.7	9.5	7.6	11.9			7.6							10.2
Sodium (Na)	210	202	205	221	219		215	196	149	186	202	207	180	196			233	211	226	129	150	191	269	229
Sulphate (SO_4^{2-})	80	69	64	47	45	44	64	52	60	77	61	80	70	82			45	77	65	70	68	89	87	68
TDS	800	790	750	780	800	780	790	620	560	710	770	690	740	750			770	820	900	510	650	720	900	740
Sulphate:Chloride Ratio	0.22	0.18	0.17	0.11	0.11	0.11	0.16	0.15	0.22	0.22	0.15	0.19	0.17	0.21	#DIV/0!	#DIV/0!	0.11	0.20	0.15	0.30	0.24	0.25	0.20	0.16
Chloride:Sulphate Ratio	4.60	5.49	5.92	8.89	9.29	9.50	6.27	6.48	4.53	4.45	6.70	5.24	5.90	4.67	#DIV/0!	#DIV/0!	9.31	5.10	6.51	3.36	4.25	4.01	5.05	6.41

YA_MB01S	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23
Date	6/01/2022	3/02/2022	8/03/2022	19/04/2022	18/05/2022	22/06/2022	20/07/2022	25/08/2022	28/09/2022	20/10/2022	17/11/2022	14/12/2022	12/01/2023
Casing Height above topo	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Depth of bore	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73	5.73
SWL (m)	2.81	3.17	3.47	3.58	3.7	3.41	3.1	1.33	1.4	1.98	2.25	2.6	3.05
m AHD	21.38	21.02	20.72	20.61	20.49	20.78	21.09	22.86	22.79	22.21	21.94	21.59	21.14
Purge	18	15	14	13	13	14	16	27	26	25	20	20	20
Field pH	5.86	5.86	5.86	5.81	5.8	6.06	5.81	6.1	6	5.74	5.94	6.01	6.06
Temp	19.6	20.1	20.9	20.3	19.7	17.6	17.8	17.1	16	17.2	17.9	19.2	20.4
Field Cond (EC)	1850	1780	1870	1460	1790	1570	1810.00	1070.00	1150.00	1520.00	1720.00	1640.00	1570.00
Field Salinity	920	890	930	730	920	750	930	530	580	760	860	820	790
Field ROP	295	319	296	338	340	315	348	344	340	330	270	265	273
Field Alkalinity	85	54	66	60	60	51	83	45	40	45	54	60	72
Field TTA	160	190	190	200	170	200	200	100	80	100	170	170	170
Field DO %S													
Comments													
Aluminium Filtered (Al)	0.02	0.038	0.014	0.042	0.027	0.028	0.032	0.086	0.03	0.014	0.019	0.03	0.016
Aluminium Total (Al)						0.67			0.085			2.8	
Arsenic (As)						0.0004			0.0001			0.0004	
Arsenic (As) Total						0.0009			0.0003			0.0013	
Boron (B)													
Cadmium (Cd)						<0.0001			<0.0001			<0.0001	
Cadmium (Cd) Total						<0.0001			<0.0001			<0.0001	
Chromium (Cr)						0.0001			0.0001			<0.0001	
Chromium (Cr) Total						0.003			0.0004			0.0037	
Chromium VI (Cr)						<0.004			<0.004			<0.004	
Chromium VI (Cr) Total						<0.004			<0.004			<0.004	
Cobolt (Co)						0.0011			0.0005			0.0011	
Cobolt (Co) Total						0.0011			0.0005			0.001	
Copper (Cu)						0.0003			0.0049			0.028	
Copper (Cu) Total						0.002			0.0011			0.002	
Iron Filtered (Fe)	9.1	11	12	14	13	12	16	0.38	1.2	2.8	4.6	8.1	4.6
Iron Total (Fe)						15			2.1			13	
Lead (Pb)						<0.0001			<0.0001				
Manganese (Mn)	0.27	0.31	0.32	0.35	0.34	0.3	0.39	0.029	0.11	0.17	0.21	0.27	0.22
Magnesium (Mg)	38.5	38.3	33.6	32.7	33.3	32.3	41.6	23	30.4	41.3	47.6	37.3	41.4
Mercury (Hg)						<0.00005			<0.00005			<0.00005	
Mercury (Hg) Total						<0.00005			<0.00005			<0.00005	
Molybdenum (Mo)													
Nickel (Ni)						0.0014			0.0008			0.0014	
Nickel (Ni) Total						0.0017			0.0008			0.0017	
Selenium (Se)						<0.0002			<0.0002			<0.0002	
Selenium (Se) Total						<0.0002			0.0002			<0.0002	
Uranium (U)						<0.0001			<0.0001			<0.0001	
Uranium (U)Total						0.0002			<0.0001			0.0003	
Zinc (Zn)						0.006			<0.005			0.015	
Zinc (Zn) Total						0.011			<0.005			0.014	
Thallium (Tl)						<0.0001			<0.0001			<0.0001	
Thallium (Tl) Total						<0.0001			<0.0001			<0.0001	
CaCO3 (Acidity)	80	120	110	110	110	120	120	57	51	54	61	31	100
CaCO3 (Alkalinity)	45	44	44	62	55	46	51	41	45	47	47	49	48
Bicarbonate	45	44	44	62	55	46	51	41	45	47	47	49	48
Calcium	14.3	12.7	7.9	8	6.7	8	9.4	14.4	18.3	23.1	25.3	13.8	22.8
Carbonate													
Ammonia (NH3-N)													
Nitrogen Total (N)													
Chloride (Cl)	453	431	411	421	412	417	438	206	264	368	426	420	391
NATA EC	1650	1630	1530	1530	1520	1500	1550	894	1090	1460	1650	1530	1470
O2													
Phosphate as PO4-P													
Phosphorus Total (P)													
NATA pH	6	6	6	6.2	6.1	5.8	5.9	6.1	6.2	6.3	6.7	6.7	6
Potassium (K)	9.8	9.6	8.3	7.2	7.5	7.8	8.9	10.8	12.2	13.9	13.6	9.4	13
Sodium (Na)	230	242	225	235	229	211	275	124	152	204	257	222	222
Sulphate (SO_4^{2-})	71	72	53	46	48	52	52	60	73	96	110	72	88
TDS	820	830	790	760	780	750	770	440	530	820	880	780	810
Sulphate:Chloride Ratio	0.16	0.17	0.13	0.11	0.12	0.12	0.12	0.29	0.28	0.26	0.26	0.17	0.23
Chloride:Sulphate Ratio	6.38	5.99	7.75	9.15	8.58	8.02	8.42	3.43	3.62	3.83	3.87	5.83	4.44

Installed December 2017-Phillip's southern boundary. Superficial aquifer only. Screens at 3-9m

YA_MB02S		Triggers	Jan-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
Date				11/01/2018	12/02/2018	12/03/2018	12/04/2018	8/05/2018	12/06/2018	10/07/2018	9/08/2018	10/09/2018	11/10/2018	8/11/2018	11/12/2018
Casing Height above topo	m		m	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Depth of bore	m		m	8.10	8.10	8.10	8.10	8.10	8.10	8.10	8.10	8.10	8.10	8.10	8.10
SWL (m)	m (from top of casing)			2.18	2.2	2.4	2.54	2.56	0.76	0.93			1.39	1.73	2
m AHD				18.99	18.97	18.77	18.63	18.61	20.41	20.24			19.78	19.44	19.17
Purge	L			71	71	68	67	66	88	86			81	76	72
Field pH		<5		5.87	5.84	5.84	5.76	5.75	5.62	5.37			5.66	5.61	5.76
Temp	degrees C			19.4	20.1	20.6	20.1	19.1	17.3	16.7			17.6	17.7	16.9
Field Cond (EC)	uS/cm	>2161.99		1900.00	1660.00	1670.00	1680.00	1650.00	2070.00	1750.00			1790.00	1670.00	1750.00
Field Salinity	ppm			950	830	830	840	820	1040	880			890	840	870
Field ROP	mv			309	303	330	306	319	302	402			203	252	194
Field Alkalinity		<24.95		Too Murky	Too Murky	105	60	66	27	33			60	57	75
Field TTA		>221.17		Too Murky	Too Murky	185	190	215	60	85			205	200	170
Field DO %S				6.2	5.9	7.9		8.6	12.6	12.8			11.8	12.4	17.4
Comments											No Access	No Access			
Aluminium Filtered (Al)	mg/L	>1		0.033	0.021	0.018	0.019	0.096	0.006	0.056			0.034	0.92	0.2
Aluminium Total (Al)	mg/L			13		61			1.9						
Arsenic (As)	mg/L			0.0003		0.0004			0.0008						
Arsenic (As) Total	mg/L														
Boron (B)	mg/L														
Cadmium (Cd)	mg/L			<0.0001		<0.0001			<0.0001						
Cadmium (Cd) Total	mg/L														
Chromium VI (Cr)	mg/L			<0.0001		<0.0001			<0.0001						
Chromium VI (Cr) Total	mg/L														
Chromium (Cr)	mg/L														
Chromium Total (Cr)	mg/L														
Cobolt (Co)	mg/L														
Cobolt (Co) Total	mg/L														
Copper (Cu)	mg/L														
Copper (Cu) Total	mg/L														
Iron Filtered (Fe)	mg/L	>25.62		15	16	15	16	20	1.7	1.4			13	20	19
Iron Total (Fe)	mg/L			47		110			1.8						
Lead (Pb)	mg/L														
Manganese (Mn)	mg/L	>0.67		0.61	0.54	0.52	0.43	0.49	0.13	0.096			0.42	0.5	0.52
Magnesium (Mg)	mg/L				27.7		23.5	26.2		30.8			31.1	29.4	29.3
Mercury (Hg)	mg/L														
Mercury (Hg) Total	mg/L														
Molybdenum (Mo)	mg/L														
Nickel (Ni)	mg/L			0.0055		0.0044			0.012						
Nickel (Ni) Total	mg/L														
Selenium (Se)	mg/L			<0.0002		<0.0002			0.0002						
Selenium (Se) Total	mg/L														
Uranium (U)	mg/L														
Uranium (U) Total	mg/L														
Zinc (Zn)	mg/L			0.019		0.016			0.007						
Zinc (Zn) Total	mg/L														
Thallium (Tl)	mg/L														
Thallium (Tl) Total	mg/L														
CaCO3 (Acidity)	mg/L			140	110	110	110	120	34	58			140	140	74
CaCO3 (Alkalinity)	mg/L			55	50	61	36	63	13	22			60	66	50
Bicarbonate	mg/L				50		36	63		22			60	66	50
Calcium	mg/L				4.5		3.9	4.3		6.9			5.8	5.3	4.9
Carbonate	mg/L														
Ammonia (NH3-N)	mg/L			0.15		0.039			<0.010						
Nitrogen Total (N)	mg/L			2.9		0.63			0.97						
Chloride (Cl)	mg/L	>569.68		460	400	410	420	430	510	440			480	427	415
NATA EC	uS/cm			1650	1500	1550	1540	1580	1960	1510			1620	1620	1580
O2	mg/L			2.3		4.2			4.3						
Phosphate as PO4-P	mg/L														
Phosphorus Total (P)	mg/L			0.56		0.79			0.2						
NATA pH				6	6	6.1	5.7	6.1	5.6	5.7			6	6.1	6.2
Potassium (K)	mg/L				6.2		4.4	6		5.1			5.8	6.6	6.3
Sodium (Na)	mg/L				239		208	217		239			238	251	247
Sulphate (SO_4^{2-})	mg/L	>120.06		79	69	63	63	62	120	100			69	62	59
TDS	mg/L	>1092.40		912	996	832	774	813	1090	857			860	850	820
Radium 226															
Sulphate:Chloride Ratio		>0.5			0.17	0.15	0.15	0.14	0.24	0.23	#DIV/0!	#DIV/0!	0.14	0.15	0.14
Chloride:Sulphate Ratio		<2			5.80	6.51	6.67	6.94	4.25	4.40	#DIV/0!	#DIV/0!	6.96	6.89	7.03

YA_MB02S		Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
Date		14/01/2019	11/02/2019	13/03/2019	10/04/2019	9/05/2019	13/06/2019	11/07/2019	14/08/2019	12/09/2019	10/10/2019	12/11/2019	12/12/2019
Casing Height above topo	m	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Depth of bore	m	8.10	8.10	8.10	8.10	8.10	8.10	8.10	8.10	8.10	8.10	8.10	8.10
SWL (m)	m (from top of casing)	2.32		2.57	2.7	2.78	2.28	0.92	1.05	1.06	1.37	1.86	2.23
m AHD		18.85		18.60	18.60	18.47	18.39	18.89	20.25	20.12	20.11	19.80	19.31
Purge	L	69		66	65	64	70	86	85	84	81	75	70
Field pH		5.72		5.74	5.78	5.97	5.86	5.56	5.58	5.63	5.7	5.86	5.9
Temp	degrees C	18.4		18.5	19.5	14.1	17.3	16.1	16.3	17.3	16.4	16.3	18.2
Field Cond (EC)	uS/cm	1740.00		1800.00	1840.00	1710.00	1750.00	1920.00	2120.00	2160.00	2110.00	1920.00	2040.00
Field Salinity	ppm	870		900	920	860	870	960	1060	1080	1050	900	1020
Field ROP	mv	230		148	236	224	177	315	331	320	264	305	316
Field Alkalinity		69		72	60	72	66	42	36	27	45	63	75
Field TTA		200		200	200	200	175	100	105	135	150	165	145
Field DO %S		15.1		14.1	14.5	14.9	14.8	19.6	17	19.5	19.7	21.2	23.3
Comments			No Access										
Aluminium Filtered (Al)	mg/L	0.12		0.027	0.047	0.087	0.028	0.018	0.014	0.023	0.021	0.042	0.031
Aluminium Total (Al)	mg/L						7.1						
Arsenic (As)	mg/L						0.0008						
Arsenic (As) Total	mg/L												
Boron (B)	mg/L												
Cadmium (Cd)	mg/L						<0.0001						
Cadmium (Cd) Total	mg/L												
Chromium VI (Cr)	mg/L						<0.0001						
Chromium VI (Cr) Total	mg/L												
Chromium (Cr)	mg/L												
Chromium Total (Cr)	mg/L												
Cobolt (Co)	mg/L												
Cobolt (Co) Total	mg/L												
Copper (Cu)	mg/L												
Copper (Cu) Total	mg/L												
Iron Filtered (Fe)	mg/L	20		22	23	23	20	2.1	2.8	3.3	14	20	18
Iron Total (Fe)	mg/L						37						
Lead (Pb)	mg/L												
Manganese (Mn)	mg/L	0.51		0.55	0.54	0.51	0.52	0.17	0.2	0.22	0.43	0.52	0.45
Magnesium (Mg)	mg/L	27.9		30.9	29.8	29		28.4	38.9	36.7	36.4	34.6	28.7
Mercury (Hg)	mg/L												
Mercury (Hg) Total	mg/L												
Molybdenum (Mo)	mg/L												
Nickel (Ni)	mg/L						0.0048						
Nickel (Ni) Total	mg/L												
Selenium (Se)	mg/L						<0.0002						
Selenium (Se) Total	mg/L												
Uranium (U)	mg/L												
Uranium (U) Total	mg/L												
Zinc (Zn)	mg/L						0.027						
Zinc (Zn) Total	mg/L												
Thallium (Tl)	mg/L												
Thallium (Tl) Total	mg/L												
CaCO3 (Acidity)	mg/L	130		55	150	130	130	48	65	36	76	98	100
CaCO3 (Alkalinity)	mg/L	53		45	63	30	60	19	23	25	25	35	26
Bicarbonate	mg/L	53		45	63	30		19	23	25	25	35	26
Calcium	mg/L	4.8		5.1	5	4.9		6.2	9.1	8.9	7.4	6.4	5
Carbonate	mg/L												
Ammonia (NH3-N)	mg/L						0.014						
Nitrogen Total (N)	mg/L						0.4						
Chloride (Cl)	mg/L	421		429	424	423	425	512	560	509	486	483	465
NATA EC	uS/cm	1580		1550	1600	1580	1620	1860	2100	1880	1770	1660	1660
O2	mg/L						5.7						
Phosphate as PO4-P	mg/L												
Phosphorus Total (P)	mg/L						0.69						
NATA pH		6		6	6.1	5.7	6.3	6	5.9	6.1	5.7	5.9	5.7
Potassium (K)	mg/L	6.1		7	7	6.6		5.5	6.5	7.2	7.2	7.4	6.4
Sodium (Na)	mg/L	238		255	248	250		250	300	293	275	269	229
Sulphate (SO_4^{2-})	mg/L	61		68	65	65	65	95	120	110	90	72	68
TDS	mg/L	880		870	880	860	910	1000	1100	940	950	890	890
Radium 226													
Sulphate:Chloride Ratio		0.14	#DIV/0!	0.16	0.15	0.15	0.15	0.19	0.21	0.22	0.19	0.15	0.15
Chloride:Sulphate Ratio		6.90	#DIV/0!	6.31	6.52	6.51	6.54	5.39	4.67	4.63	5.40	6.71	6.84

YA_MB02S		Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Date		14/01/2020	13/02/2020	11/03/2020	9/04/2020	12/05/2020	9/06/2020	13/07/2020	6/08/2020	9/09/2020	14/10/2020	10/11/2020	8/12/2020
Casing Height above topo	m	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Depth of bore	m	8.10	8.10	8.10	8.10	8.10	8.10	8.10	8.10	8.10	8.10	8.10	8.10
SWL (m)	m (from top of casing)	2.54	2.74	2.89	2.98	2.61	2.29	1.3	0.92	0.69	1.37	1.65	1.96
m AHD		18.94	18.63	18.43	18.28	18.19	18.56	18.88	19.87	20.25	20.48	19.80	19.52
Purge	L	33	32	31	30	33	35	41	43	44	40	39	37
Field pH		5.82	5.75	5.72	5.65	5.9	5.97	5.9	5.5	5.43	5.65	5.66	5.85
Temp	degrees C	18.1	19	21.2	21.7	17.6	19.4	17.5	16.3	17	16.9	15.5	16.9
Field Cond (EC)	uS/cm	1750.00	1710.00	1660.00	1730.00	1700.00	1810.00	1780.00	2130.00	2080.00	1860.00	1920.00	1850.00
Field Salinity	ppm	870	860	830	860	850	900	890	1060	1040	930	960	920
Field ROP	mv	375	370	357	378	275	348	391	393	346	398	357	390
Field Alkalinity		57	66	48	54	63	60	51	30	39	60	66	63
Field TTA		155	165	160	138	160.000	155	170	100	120	150	150	150
Field DO %S		24.9	16.2	18.1	17.3	16.7	13.9	15.4	16.6	20.2	13.1	15.4	17.1
Comments													
Aluminium Filtered (Al)	mg/L	0.034	0.021	0.028	0.055	0.033	0.022	0.027	0.043	0.016	0.027	0.02	0.032
Aluminium Total (Al)	mg/L						1.1						
Arsenic (As)	mg/L						0.0006						
Arsenic (As) Total	mg/L												
Boron (B)	mg/L												
Cadmium (Cd)	mg/L						<0.0001						
Cadmium (Cd) Total	mg/L												
Chromium VI (Cr)	mg/L						<0.0001						
Chromium VI (Cr) Total	mg/L												
Chromium (Cr)	mg/L												
Chromium Total (Cr)	mg/L												
Cobolt (Co)	mg/L												
Cobolt (Co) Total	mg/L												
Copper (Cu)	mg/L												
Copper (Cu) Total	mg/L												
Iron Filtered (Fe)	mg/L	19	17	19	17	22.000	19	20	0.28	1.9	16	17	17
Iron Total (Fe)	mg/L						26						
Lead (Pb)	mg/L												
Manganese (Mn)	mg/L	0.51	0.45	0.49	0.47	0.530	0.49	0.52	0.098	0.21	0.47	0.52	0.47
Magnesium (Mg)	mg/L	37.1	33.4	33.9	33.4	33.2		29.8	41.5	43.9	35.7	41.3	34.8
Mercury (Hg)	mg/L												
Mercury (Hg) Total	mg/L												
Molybdenum (Mo)	mg/L												
Nickel (Ni)	mg/L						0.0041						
Nickel (Ni) Total	mg/L												
Selenium (Se)	mg/L						<0.0002						
Selenium (Se) Total	mg/L												
Uranium (U)	mg/L												
Uranium (U) Total	mg/L												
Zinc (Zn)	mg/L						0.01						
Zinc (Zn) Total	mg/L												
Thallium (Tl)	mg/L												
Thallium (Tl) Total	mg/L												
CaCO3 (Acidity)	mg/L	120	110	100	100	130	120	130	69	66	120	100	76
CaCO3 (Alkalinity)	mg/L	56	29	41	30	61	48	64	17	28	49	42	26
Bicarbonate	mg/L	56	29	41	30	61		64	17	28	49	42	26
Calcium	mg/L	6.3	5.5	5.6	5.5	5.5		5	11.1	11.2	7	8.2	7.2
Carbonate	mg/L												
Ammonia (NH3-N)	mg/L						0.034						
Nitrogen Total (N)	mg/L						0.3						
Chloride (Cl)	mg/L	435	445	450	475	480	497	487	581	548	516	529	505
NATA EC	uS/cm	1640	1600	1640	1660	1660	1810	1730	2090	2070	1760	1890	1740
O2	mg/L						4.4						
Phosphate as PO4-P	mg/L												
Phosphorus Total (P)	mg/L						0.54						
NATA pH		6.1	5.8	5.9	5.7	6.1	6.1	6.1	5.7	5.9	6.1	6	5.8
Potassium (K)	mg/L	7.3	7	7.1	6.6	7.1		6.6	8.6	8.4	7.1	8	7.2
Sodium (Na)	mg/L	289	260	257	253	234		238	335	333	264	289	253
Sulphate (SO_4^{2-})	mg/L	67	67	66	69	68	80	70	150	130	90	63	97
TDS	mg/L	910	850	890	910	910	1000	880	1100	1100	1000	1000	820
Radium 226													
Sulphate:Chloride Ratio		0.15	0.15	0.15	0.15	0.14	0.16	0.14	0.26	0.24	0.17	0.12	0.19
Chloride:Sulphate Ratio		6.49	6.64	6.82	6.88	7.06	6.21	6.96	3.87	4.22	5.73	8.40	5.21

YA_MB02S		Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
Date		12/01/2021	10/02/2021	17/03/2021	19/04/2021	12/05/2021	9/06/2021	7/07/2021	9/08/2021	13/09/2021	19/10/2021	11/11/2021	15/12/2021
Casing Height above topo	m	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Depth of bore	m	8.10	8.10	8.10	8.10	8.10	8.10	8.10	8.10	8.10	8.10	8.10	8.10
SWL (m)	m (from top of casing)	2.42	2.55	2.65	2.47	2.32	1.92	1.13			1.17	1.5	2
m AHD		19.21	18.75	18.62	18.52	18.7	18.85	19.25			21.17	20.00	19.67
Purge	L	34	33	33	34	35	37	42			42	40	37
Field pH		5.78	5.85	5.79	5.89	6.1	5.85	5.85			5.86	5.94	5.95
Temp	degrees C	20	19.9	17.1	18.4	18.7	18.1	17.4			17.1	17.7	18.6
Field Cond (EC)	uS/cm	1780.00	1850.00	1780.00	2030.00	2080.00	2110.00	1850.00			1900.00	1940.00	1890.00
Field Salinity	ppm	890	920	890	1010	1040	1060	920			950	970	940
Field ROP	mv	392	369	403	463	401	359	423			388	398	299
Field Alkalinity		57	60	72	69	57	63	72			48	51	75
Field TTA		160.000	170	166	156	118	150	150			165	175	167
Field DO %S		16.6	18.1	8.6	19.3	18.3							
Comments													
Aluminium Filtered (Al)	mg/L	0.016	0.028	0.033	0.027	0.015	0.018	0.029	no access	no access	0.021	0.032	0.026
Aluminium Total (Al)	mg/L												0.14
Arsenic (As)	mg/L						0.0004						0.0009
Arsenic (As) Total	mg/L												
Boron (B)	mg/L												
Cadmium (Cd)	mg/L						<0.0001						<0.0001
Cadmium (Cd) Total	mg/L												
Chromium VI (Cr)	mg/L						<0.0001						<0.005
Chromium VI (Cr) Total	mg/L												
Chromium (Cr)	mg/L												0.0006
Chromium Total (Cr)	mg/L												
Cobolt (Co)	mg/L						0.0023						0.0039
Cobolt (Co) Total	mg/L												
Copper (Cu)	mg/L						0.0003						0.0078
Copper (Cu) Total	mg/L												
Iron Filtered (Fe)	mg/L	16.000	21	20	15	11	14	27			18	21	23
Iron Total (Fe)	mg/L												26
Lead (Pb)	mg/L												
Manganese (Mn)	mg/L	0.410	0.51	0.49	0.46	0.46	0.42	0.6			0.48	0.52	0.55
Magnesium (Mg)	mg/L	30.6	37	40.9	41.6	46.4							34.7
Mercury (Hg)	mg/L						<0.00005						<0.00005
Mercury (Hg) Total	mg/L												
Molybdenum (Mo)	mg/L												
Nickel (Ni)	mg/L						0.0051						0.005
Nickel (Ni) Total	mg/L												
Selenium (Se)	mg/L						<0.0002						<0.0002
Selenium (Se) Total	mg/L												
Uranium (U)	mg/L						0.0025						0.0002
Uranium (U) Total	mg/L												
Zinc (Zn)	mg/L						<0.005						0.007
Zinc (Zn) Total	mg/L												
Thallium (Tl)	mg/L						<0.0001						<0.0001
Thallium (Tl) Total	mg/L												
CaCO3 (Acidity)	mg/L	89	120	100	120	82	98	110			110	43	140
CaCO3 (Alkalinity)	mg/L	29	58	61	46	47	31	56			42	21	61
Bicarbonate	mg/L	29	58	61	46	47							61
Calcium	mg/L	5.4	6.7	7.6	9.1	9.2							6.6
Carbonate	mg/L												
Ammonia (NH3-N)	mg/L												
Nitrogen Total (N)	mg/L												
Chloride (Cl)	mg/L	494	500	485	519	509	580	494			517	474	485
NATA EC	uS/cm	1670	1760	1800	1880	1870	2090	1720			1720	1440	1720
O2	mg/L												
Phosphate as PO4-P	mg/L												
Phosphorus Total (P)	mg/L												
NATA pH		5.7	6.1	6	6.2	6.1	6	6.3			6.2	6.4	6.2
Potassium (K)	mg/L	6.5	8.3	8.5	8	10							8.6
Sodium (Na)	mg/L	235	281	297	296	341	351	265			272	269	262
Sulphate (SO_4^{2-})	mg/L	76	77	72	87	86	100	71			74	71	68
TDS	mg/L	860	930	920	980	970	1100	930			870	850	850
Radium 226			0.07				0.09						0.06
Sulphate:Chloride Ratio		0.15	0.15	0.15	0.17	0.17	0.17	0.14	#DIV/0!	#DIV/0!	0.14	0.15	0.14
Chloride:Sulphate Ratio		6.50	6.49	6.74	5.97	5.92	5.80	6.96	#DIV/0!	#DIV/0!	6.99	6.68	7.13

YA_MB02S		Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23
Date		11/01/2022	8/02/2022	2/03/2022	5/04/2022	11/05/2022	22/06/2022	19/07/2022	25/08/2022	20/09/2022	19/10/2022	16/11/2022	13/12/2022	12/01/2023
Casing Height above topo	m	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Depth of bore	m	8.10	8.10	8.10	8.10	8.10	8.10	8.10	8.10	8.10	8.10	8.10	8.10	8.10
SWL (m)	m (from top of casing)	2.3	2.64	2.77	2.97	3.01	2.28	1.67	0.93	0.78	1.45	1.83	2.13	2.48
m AHD		19.17	18.87	18.53	18.40	18.20	18.16	18.89	19.50	20.24	20.39	19.72	19.34	19.04
Purge	L	35	33	32	31	31	35	38	58	65	40	35	30	30
Field pH		5.86	5.91	5.9	5.83	5.87	5.98	5.84	5.4	5.63	5.78	5.83	5.82	5.96
Temp	degrees C	20.6	19.6	19.5	17.6	18.1	18.4	18.4	17.4	16.6	18.7	18.9	17.4	18.6
Field Cond (EC)	uS/cm	1990.00	1920.00	2040.00	2120.00	2130.00	2110.00	2100.00	1920.00	2110.00	2160.00	1950.00	1890.00	1940.00
Field Salinity	ppm	990	960	1020	1060	1090	1060	1070	960	1060	1080	960	940	960
Field ROP	mv	393	412	310	571	355	369	341	344	311	310	270	240	354
Field Alkalinity		84	65	63	48	45	45	60	40	75	45	45	60	60
Field TTA		170	180	190	200	180	130	200	200	180	180	190	190	190
Field DO %S														
Comments														
Aluminium Filtered (Al)	mg/L	0.03	0.031	0.058	0.034	0.02	0.015	0.037	0.034	0.03	0.036	0.031	0.045	0.03
Aluminium Total (Al)	mg/L						0.4			0.048			0.14	
Arsenic (As)	mg/L						0.0004			0.0005			0.0008	
Arsenic (As) Total	mg/L						0.0011			0.0005			0.0008	
Boron (B)	mg/L													
Cadmium (Cd)	mg/L						<0.0001			<0.0001			<0.0001	
Cadmium (Cd) Total	mg/L						<0.0001			<0.0001			<0.0001	
Chromium VI (Cr)	mg/L						<0.004			<0.004			<0.004	
Chromium VI (Cr) Total	mg/L						<0.004			<0.004			<0.004	
Chromium (Cr)	mg/L						<0.0001			0.0002			0.0002	
Chromium Total (Cr)	mg/L						0.0014			0.0002			0.0003	
Cobolt (Co)	mg/L						0.0029			0.0087			0.0044	
Cobolt (Co) Total	mg/L						0.0029			0.0087			0.004	
Copper (Cu)	mg/L						0.0004			0.0007			0.0006	
Copper (Cu) Total	mg/L						0.0032			0.001			0.0019	
Iron Filtered (Fe)	mg/L	21	23	27	22	19	13	32	0.31	6.8	19	22	25	24
Iron Total (Fe)	mg/L						19			6.9			26	
Lead (Pb)	mg/L						<0.0001			<0.0001			<0.0001	
Manganese (Mn)	mg/L	0.5	0.57	0.58	0.57	0.59	0.47	0.7	0.12	0.35	0.52	0.54	0.59	0.56
Magnesium (Mg)	mg/L	32.5	60.4	36.4	36.9	39.4	39.8	38.9	41	55.2	46.2	39.3	37	41.2
Mercury (Hg)	mg/L						<0.00005			<0.00005			<0.00005	
Mercury (Hg) Total	mg/L						<0.00005			<0.00005			<0.00005	
Molybdenum (Mo)	mg/L													
Nickel (Ni)	mg/L						0.0044			0.005			0.0055	
Nickel (Ni) Total	mg/L						0.0044			0.005			0.0055	
Selenium (Se)	mg/L						<0.0002			<0.0002			<0.0002	
Selenium (Se) Total	mg/L						<0.0002			0.0002			<0.002	
Uranium (U)	mg/L						<0.0001			<0.0001			<0.0001	
Uranium (U) Total	mg/L						0.0005			<0.0001			0.0002	
Zinc (Zn)	mg/L						0.005			0.002			0.015	
Zinc (Zn) Total	mg/L						0.011			<0.005			0.022	
Thallium (Tl)	mg/L						<0.0001			<0.0001			<0.0001	
Thallium (Tl) Total	mg/L						<0.0001			<0.0001			<0.0001	
CaCO3 (Acidity)	mg/L	150	83	130	130	150	84	100	88	76	57	66	130	140
CaCO3 (Alkalinity)	mg/L	63	61	55	57	31	41	40	14	23	24	50	60	45
Bicarbonate	mg/L	63	61	55	57	31	41	40	14	23	24	50	60	45
Calcium	mg/L	6.3	6.6	6.2	6.7	7.7	8	6.5	10.9	12.9	9.3	7.4	6.7	8.2
Carbonate	mg/L													
Ammonia (NH3-N)	mg/L													
Nitrogen Total (N)	mg/L													
Chloride (Cl)	mg/L	475	508	476	519	506	546	505	497	629	600	522	520	512
NATA EC	uS/cm	1780	1730	1810	1870	1820	2030	1780	1910	2320	1980	1740	1840	1790
O2	mg/L													
Phosphate as PO4-P	mg/L													
Phosphorus Total (P)	mg/L													
NATA pH		6.1	6.2	6.3	6.1	6	6	6.2	5.5	5.8	6	6.6	6.1	5.9
Potassium (K)	mg/L	7.2	8.2	7.9	8.1	8.5	8.1	8.2	14.8	11.2	9.5	8.6	7.7	9.2
Sodium (Na)	mg/L	257	272	279	281	308	283	296	312	381	339	272	278	304
Sulphate (SO_4^{2-})	mg/L	71	71	69	73	72	100	72	130	150	120	79	75	76
TDS	mg/L	860	900	870	980	920	1000	860	950	1300	1100	1100	920	970
Radium 226							0.03			0.01				0.08
Sulphate:Chloride Ratio		0.15	0.14	0.14	0.14	0.14	0.18	0.14	0.26	0.24	0.20	0.15	0.14	0.15
Chloride:Sulphate Ratio		6.69	7.15	6.90	7.11	7.03	5.46	7.01	3.82	4.19	5.00	6.61	6.93	6.74

YA_MB03S			Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20
Date		Triggers	19/06/2019				21/10/2019	11/11/2019	12/12/2019	13/01/2020	11/02/2020	12/03/2020	9/04/2020	7/05/2020	9/06/2020
Casing Height above topo	m		0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
Depth of bore	m		9.12	9.12	9.12	9.12	9.12	9.12	9.12	9.12	9.12	9.12	9.12	9.12	9.12
SWL (m)	m (from top of casing)		1.07				1.17	1.4	1.72	1.86	1.96	2.16	2.21	2.58	1.32
m AHD			18.76				18.05	17.82	17.5	17.36	17.26	17.06	17.01	16.64	17.90
Purge	L		> 500 L				382	371	355	174	172	167	165	157	187
Field pH		<5	6.05				6.05	6.02	6.03	6.07	6	5.96	5.8	5.66	5.92
Temp	degrees C		17.4				18.6	19	19.7	19.1	20.5	19.6	20.3	20.3	17.8
Field Cond (EC)	uS/cm	>2236.96	1860.00				2060.00	2060.00	2230.00	1920.00	1930.00	1920.00	1910.00	1900.00	1700.00
Field Salinity	ppm		920				1030	1030	1120	960	970	960	950	950	850
Field ROP	mv						295	284	288	381	390	364	400	418	403
Field Alkalinity		<39.5					75	78	90	75	81	72	75	72	48
Field TTA		>210.95					165	160	180	180	200	160	178	160	130
Field DO %S							25.8	21.2	24.8	25.3	17.1	14.5	14.2	14.7	15.3
Comments			L9	No Access	No Access	No Access									
Aluminium Filtered (Al)	mg/L	>1	0.039				0.026	0.04	0.024	0.032	0.034	0.032	0.038	0.017	0.012
Aluminium Total (Al)	mg/L		0.087												0.016
Arsenic (As)	mg/L		0.0034												0.0038
Arsenic (As) Total	mg/L														
Boron (B)	mg/L														
Cadmium (Cd)	mg/L		<0.0001												<0.0001
Cadmium (Cd) Total	mg/L														
Calcium (Ca)	mg/L														
Chromium (Cr)	mg/L		<0.0001												<0.0001
<0.0001	mg/L														
Chromium VI (Cr)	mg/L														
Chromium VI (Cr) Total	mg/L														
Cobolt (Co)	mg/L														
Cobolt (Co) Total	mg/L														
Copper (Cu)	mg/L														
Copper (Cu) Total	mg/L														
Iron Filtered (Fe)	mg/L	>29.87	14				24	25	22	27	25	27	23	7.2	1.4
Iron Total (Fe)	mg/L		19												2.1
Lead (Pb)	mg/L														
Manganese (Mn)	mg/L	>0.9	0.96				0.71	0.76	0.68	0.79	0.71	0.78	0.74	0.63	0.59
Magnesium (Mg)	mg/L						37	37.8	32.9	39.6	36.9	38.5	36.5	32.4	
Mercury (Hg)	mg/L														
Mercury (Hg) Total	mg/L														
Molybdenum (Mo)	mg/L														
Nickel (Ni)	mg/L		0.012												0.033
Nickel (Ni) Total	mg/L														
Selenium (Se)	mg/L		<0.0002												<0.0002
Selenium (Se) Total	mg/L														
Uranium (U)	mg/L														
Uranium (U) Total	mg/L														
Zinc (Zn)	mg/L		0.013												0.22
Zinc (Zn) Total	mg/L														
Thallium (Tl)	mg/L														
Thallium (Tl)Total	mg/L														
CaCO3 (Acidity)	mg/L		96				130	150	110	140	140	79	120	130	69
CaCO3 (Alkalinity)	mg/L		50				79	78	38	79	83	41	40	59	45
Bicarbonate	mg/L						79	78	38	79	83	41	40	59	
Calcium	mg/L						7.7	7.6	6.5	7.4	6.8	7.1	7	18.7	
Carbonate	mg/L														
Ammonia (NH3-N)	mg/L		0.076												0.022
Nitrogen Total (N)	mg/L		0.45												0.7
Chloride (Cl)	mg/L	>602.45	455				527	515	525	494	527	535	515	516	425
NATA EC	uS/cm		1660				1900	1900	1820	1850	1860	1770	1820	1780	1640
O2	mg/L		3.6												4.8
Phosphate as PO4-P	mg/L														
Phosphorus Total (P)	mg/L		0.23												0.027
NATA pH			6.1				6.3	6.2	5.8	6.3	6.2	5.8	5.8	6.1	6.2
Potassium (K)	mg/L						7.9	8.3	7	7.9	7.5	8.1	7.4	11.3	
Sodium (Na)	mg/L						287	285	252	290	274	280	267	243	
Sulphate (SO_4^{2-})	mg/L	>96.42	58				57	57	56	58	58	59	59	75	130
TDS	mg/L	>1086.26	870				960	970	970	980	1000	940	990	1000	970
Sulphate:Chloride Ratio		>0.5	0.13	#DIV/0!	#DIV/0!	#DIV/0!	0.11	0.11	0.11	0.12	0.11	0.11	0.11	0.15	0.31
Chloride:Sulphate Ratio		<2	7.84	#DIV/0!	#DIV/0!	#DIV/0!	9.25	9.04	9.38	8.52	9.09	9.07	8.73	6.88	3.27

YA_MB03S	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21
Date	9/07/2020	10/08/2020	9/09/2020	13/10/2020	9/11/2020	8/12/2020	13/01/2021	8/02/2021	11/03/2021	15/04/2021	10/05/2021	8/06/2021	7/07/2021	9/08/2021	13/09/2021	19/10/2021
Casing Height above topo	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
Depth of bore	9.12	9.12	9.12	9.12	9.12	9.12	9.12	9.12	9.12	9.12	9.12	9.12	9.12	9.12	9.12	9.12
SWL (m)	0.7	0.55	0.46	0.99	1.3	1.48	1.86	1.74	1.74	1.51	1.33	1	0.55	0.39	0.54	0.95
m AHD	18.52	18.67	18.76	18.23	17.92	17.74	17.36	17.48	17.48	17.71	17.89	18.22	18.67	18.83	18.68	18.27
Purge	202	206	208	195	188	183	174	177	177	183	187	195	206	210	206	196
Field pH	6.05	5.91	5.91	5.9	5.95	6.01	5.9	5.96	5.71	5.7	5.65	5.72	5.86	6.03	6	6
Temp	16.7	18.5	17.5	16.8	18.6	18.3	17.9	19.9	21.5	20.7	19.8	16.7	17.9	18.3	18.8	18.8
Field Cond (EC)	1800.00	1890.00	1860.00	1920.00	1900.00	1880.00	1860.00	1850.00	1890.00	1350.00	1500.00	1800.00	2020	2090	1970	2040
Field Salinity	900	940	930	960	950	940	930	930	950	680	750	900	1010	1050	990	1020
Field ROP	407	423	394	375	362	377	415	430	400	469	442	412	464	370	363	347
Field Alkalinity	63	84	90	96	96	84	90	72	60	36	45	63	72	102	87	63
Field TTA	160	170	170	190	180	170	185	145	118	98	85	125	145	145	180	165
Field DO %S		11.4	19.9	9.3	18.1	15.5	15.3	12.8	16.6	20.6	19.1					
Comments																
Aluminium Filtered (Al)	0.019	0.02	0.03	0.031	0.039	0.016	0.02	0.019	0.02	0.017	<0.005	<0.005	0.017	0.013	0.02	0.02
Aluminium Total (Al)																
Arsenic (As)																
Arsenic (As) Total																
Boron (B)																
Cadmium (Cd)																
Cadmium (Cd) Total																
Calcium (Ca)																
Chromium (Cr)																
<0.0001																
Chromium VI (Cr)																
Chromium VI (Cr) Total																
Cobolt (Co)																
Cobolt (Co) Total																
Copper (Cu)																
Copper (Cu) Total																
Iron Filtered (Fe)	11	20	23	23	25	22	26	21	3.5	0.29	0.11	3.9	15	22	24	26
Iron Total (Fe)																
Lead (Pb)																
Manganese (Mn)	0.64	0.67	0.69	0.66	0.64	0.68	0.7	0.7	0.57	0.33	0.35	0.58	0.61	0.71	0.68	0.68
Magnesium (Mg)	34.6	36.7	37.9	36.7	35.6	35.9	38.2	37.2	35.5	25.2	26.3					
Mercury (Hg)																
Mercury (Hg) Total																
Molybdenum (Mo)																
Nickel (Ni)																
Nickel (Ni) Total																
Selenium (Se)																
Selenium (Se) Total																
Uranium (U)																
Uranium (U) Total																
Zinc (Zn)																
Zinc (Zn) Total																
Thallium (Tl)																
Thallium (Tl)Total																
CaCO3 (Acidity)	86	130	99	140	120	79	110	110	110	53	54	110	98	140	83	120
CaCO3 (Alkalinity)	53	74	76	76	43	43	76	53	57	30	31	48	60	55	40	48
Bicarbonate	53	74	76	76	43	43	76	53	57	30	31					
Calcium	18.1	11.4	9.8	8.1	7.6	8.1	8.2	10.5	22.3	34.3	48.1					
Carbonate																
Ammonia (NH3-N)																
Nitrogen Total (N)																
Chloride (Cl)	507	510	505	500	511	502	516	499	512	319	323	515	525	531	518	524
NATA EC	1750	1860	1850	1850	1830	1780	1870	886	1830	1280	1440	1720	1830	1900	1870	1830
O2																
Phosphate as PO4-P																
Phosphorus Total (P)																
NATA pH	6	6.2	6.4	6.2	6.1	6	6.3	6.2	6	6.1	6	6	6.3	6.4	6	6.2
Potassium (K)	9	9.2	8.4	8	7.8	8	8.9	10.2	13.9	17.1	25.1					
Sodium (Na)	262	277	284	269	266	255	273	272	274	180	182	256	267	293	294	290
Sulphate (SO_4^{2-})	65	59	55	61	59	59	58	61	73	75	100	71	58	57	57	56
TDS	950	940	950	1000	990	820	940	970	950	680	750	940	1000	960	910	900
Sulphate:Chloride Ratio	0.13	0.12	0.11	0.12	0.12	0.12	0.11	0.12	0.14	0.24	0.31	0.14	0.11	0.11	0.11	0.11
Chloride:Sulphate Ratio	7.80	8.64	9.18	8.20	8.66	8.51	8.90	8.18	7.01	4.25	3.23	7.25	9.05	9.32	9.09	9.36

YA_MB03S	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23
Date	10/11/2021	21/12/2021	10/01/2022	8/02/2022	10/03/2022	5/04/2022	11/05/2022	22/06/2022	19/07/2022	10/08/2022	14/09/2022	18/10/2022	8/11/2022	13/12/2022	10/11/2023
Casing Height above topo	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
Depth of bore	9.12	9.12	9.12	9.12	9.12	9.12	9.12	9.12	9.12	9.12	9.12	9.12	9.12	9.12	9.12
SWL (m)	1.14	1.5	1.65	1.8	1.82	1.93	1.92	0.97	0.72	0.44	0.64	1.06	1.26	1.45	1.57
m AHD	18.08	17.72	17.57	17.42	17.40	17.29	17.30	18.25	18.50	18.78	18.58	18.16	17.96	17.77	17.65
Purge	192	183	179	175	173	173	174	195	200	208	205	193	180	170	160
Field pH	6.03	6.03	6.07	5.91	5.9	5.9	5.9	5.72	5.82	5.84	6.11	5.88	5.84	5.79	5.95
Temp	19.1	20.1	19.7	19.9	19.5	19.5	19.1	19.6	20.7	21.3	17.4	19.6	20.3	19.3	20.8
Field Cond (EC)	2070	2070	2120	2090	2040	2040	2260	1530	2180.00	2070.00	2000.00	2030.00	2050.00	2050.00	2170.00
Field Salinity	1030	1040	1060	1040	1020	1020	1150	760	1110	1040	1000	1010	1030	1030	1050
Field ROP	364	335	358	397	316	575	343	351	330	341	367	320	268	260	210
Field Alkalinity	60	69	75	87	84	66	66	42	44	66	54	90	60	75	105
Field TTA	166	190	210	230	210	210	230	100	150	230	180	190.000	200	180	230
Field DO %S															
Comments															
Aluminium Filtered (Al)	0.021	0.04	0.024	0.028	0.023	0.046	0.04	<0.005	0.033	0.022	0.025	0.028	0.028	0.038	0.036
Aluminium Total (Al)								0.026			0.027			0.052	
Arsenic (As)								0.005			0.0055			0.0077	
Arsenic (As) Total								0.005			0.006			0.0057	
Boron (B)															
Cadmium (Cd)								<0.0001			<0.0001			<0.0001	
Cadmium (Cd) Total								<0.0001			<0.0001			<0.0001	
Calcium (Ca)															
Chromium (Cr)								0.0001			<0.0001			0.0008	
<0.0001								0.0063			<0.004				
Chromium VI (Cr)								<0.004			<0.004			<0.004	
Chromium VI (Cr) Total								<0.004			<0.004			<0.004	
Cobolt (Co)								0.093			0.023			0.012	
Cobolt (Co) Total								0.099			0.024			0.0099	
Copper (Cu)								0.0003			<0.0001			0.0007	
Copper (Cu) Total								0.0008			<0.0001			0.0003	
Iron Filtered (Fe)	26	27	26	26	28	27	28	<0.005	17	22	26	28	29	27	
Iron Total (Fe)								3.4			26			28	28
Lead (Pb)								<0.0001			<0.0001			<0.0001	
Manganese (Mn)	0.7	0.7	0.67	0.71	0.73	0.7	0.77	0.42	0.74	0.74	0.79	0.750	0.74	0.75	0.71
Magnesium (Mg)		40.9	39.5	40.8	41.6	41.1	42.8	27	46	44.9	48.5	42.7	43.7	43	44.7
Mercury (Hg)								<0.00005			<0.00005			<0.00005	
Mercury (Hg) Total								<0.00005			<0.00005			<0.00005	
Molybdenum (Mo)															
Nickel (Ni)								0.075			0.033			0.021	
Nickel (Ni) Total								0.086			0.036			0.018	
Selenium (Se)								<0.002			<0.0002			<0.0002	
Selenium (Se) Total								<0.0002			<0.0002			<0.0002	
Uranium (U)								0.0001			<0.0001			<0.0001	
Uranium (U) Total								0.0001			0.0001			<0.0001	
Zinc (Zn)								0.14			0.005			0.1	
Zinc (Zn) Total								0.15			0.11			0.089	
Thallium (Tl)								<0.0001			<0.0001			<0.0001	
Thallium (Tl)Total								<0.0001			<0.0001			<0.0001	
CaCO3 (Acidity)	130	140	95	97	130	130	150	69	100	120	120	130	79	140	160
CaCO3 (Alkalinity)	62	80	79	77	33	82	77	50	52	58	33	37	67	79	75
Bicarbonate		80	79	77	33	82	77	50	52	58	33	37	67	79	75
Calcium		8.5	8.2	8.3	8.6	8.4	8.7	13.9	12.9	11	10.7	8.9	8.9	8.2	9.9
Carbonate															
Ammonia (NH3-N)															
Nitrogen Total (N)															
Chloride (Cl)	515	529	535	536	529	543	554	394	539	560	553	559	555	565	568
NATA EC	1930	1950	1970	1900	1930	1990	2010	1480	1890	1960	1960	1950	1920	1930	2050
O2															
Phosphate as PO4-P															
Phosphorus Total (P)															
NATA pH	5.9	6.4	6.2	6.3	6.1	6.3	6.2	6	6.2	6	5.7	5.7	6.7	6.2	6.1
Potassium (K)		9.6	9	9.2	9.6	9.1	9.4	9.6	10.3	10.1	10.2	10.1	10.1	8.8	10.7
Sodium (Na)	280	288	288	286	298	293	307	208	330	320	346	315	294	312	325
Sulphate (SO_4^{2-})	57	58	59	58	58	58	60	64	58	58	59	61	58	61	60
TDS	950	1000	970	900	940	990	930	730	890	980	1100	1000	1100	920	960
Sulphate:Chloride Ratio	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.16	0.11	0.10	0.11	0.11	0.10	0.11	0.11
Chloride:Sulphate Ratio	9.04	9.12	9.07	9.24	9.12	9.36	9.23	6.16	9.29	9.66	9.37	9.16	9.57	9.26	9.47

Installed December 2017-located on boundary strip between 2 MacLeay lots . Superficial aquifer only. Screens at 3-9m

YA_MB04S		Triggers	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19
Date			17/01/2018	15/02/2018	15/03/2018	18/04/2018	14/05/2018	14/06/2018	11/07/2018	9/08/2018	11/09/2018	10/10/2018	8/11/2018	11/12/2018	14/01/2019	11/02/2019	13/03/2019
Casing Height above topo	m	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Depth of bore	m	9.00	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27
SWL (m)	m (from top of casing)		2.07	2.21	2.32	2.41	2.41	1.29	1.03			1.59	1.82	2.06	2.2	2.33	2.38
m AHD			21.50	21.36	21.25	21.16	21.16	22.28	22.54			21.98	21.75	21.51	21.37	21.24	21.19
Purge	L		74	73	71	70	70	84	87			80	77	75	73	71	71
Field pH		<5	5.68	5.69	5.7	5.61	5.58	5.65	5.58			5.6	5.45	5.47	5.54	5.66	5.68
Temp	degrees C		19.5	19.1	20.3	19.1	18.6	17.2	17			17.9	19.5	18.3	19	18	18.9
Field Cond (EC)	uS/cm	>1699.30	1670.00	1490.00	1510.00	1550.00	1570.00	1550.00	1570.00			1550.00	1500.00	1570.00	1640.00	1590.00	1690.00
Field Salinity	ppm		850	740	750	770	780	780	790			780	750	790	820	800	850
Field ROP	mv		281	264	275	305	355	307	397			283	306	210	281	294	292
Field Alkalinity		<25.39	48	81	90	42	51	43	45			36	42	51	51	48	51
Field TTA		>174.79	142	145	150	130	145	135	130			140	140	150	160	170	170
Field DO %S			10.7	10.7	10.1		10.5	10.9	10.8			12.6	14.4	15.4	15.5	16.1	16.1
Comments										No Access	No Access						
Aluminium Filtered (Al)	mg/L	>1	0.011	0.017	0.031	0.029	0.067	0.058	0.021			0.014	0.015	0.12	0.025	0.017	0.017
Aluminium Total (Al)	mg/L		17		1.5			0.25									
Arsenic (As)	mg/L		0.0004		0.0003			0.0004									
Arsenic (As) Total	mg/L																
Boron (B)	mg/L																
Cadmium (Cd)	mg/L		<0.0001		<0.0001			<0.0001									
Cadmium (Cd) Total	mg/L																
Chromium (Cr)	mg/L		0.0015		<0.0001			<0.0001									
Chromium (Cr) Total	mg/L																
Chromium VI (Cr)	mg/L																
Chromium VI (Cr) Total	mg/L																
Cobolt (Co)	mg/L																
Cobolt (Co) Total	mg/L																
Copper (Cu)	mg/L																
Copper (Cu) Total	mg/L																
Iron Filtered (Fe)	mg/L	>13.04	8.5	8.4	9.2	0.27	9.8	9.8	9.5			8	7.9	11	8.6	8.7	10
Iron Total (Fe)	mg/L		13		11			11									
Lead (Pb)	mg/L																
Manganese (Mn)	mg/L	>0.25	0.18	0.18	0.19	0.2	0.21	0.21	0.19			0.16	0.17	0.22	0.18	0.18	0.21
Magnesium (Mg)	mg/L			25.1		25.7	26.2		25.5			21	23.5	26.2	22	22	25.1
Mercury (Hg)	mg/L																
Mercury (Hg) Total	mg/L																
Molybdenum (Mo)	mg/L																
Nickel (Ni)	mg/L		0.0007		<0.0005			0.0006									
Nickel (Ni) Total	mg/L																
Selenium (Se)	mg/L		<0.0002		<0.0002			<0.0002									
Selenium (Se) Total	mg/L																
Uranium (U)	mg/L																
Uranium (U) Total	mg/L																
Zinc (Zn)	mg/L		0.012		0.004			0.006									
Zinc (Zn) Total	mg/L																
Thallium (Tl)	mg/L																
Thallium (Tl) Total	mg/L																
CaCO3 (Acidity)	mg/L		100	100	100	70	110	100	110			67	110	80	100	78	59
CaCO3 (Alkalinity)	mg/L		40	23	22	34	36	23	40			39	41	37	32	36	32
Bicarbonate	mg/L			23		34	36		40			39	41	37	32	36	32
Calcium	mg/L			4.3		4.7	5.1		4.6			3.8	4.3	4.6	4.1	4	4.7
Carbonate	mg/L																
Ammonia (NH3-N)	mg/L		0.061		0.064			0.053									
Nitrogen Total (N)	mg/L		0.41		0.091			0.16									
Chloride (Cl)	mg/L	>435.48	370	410	410	400	390	420	410			429	396	396	387	426	402
NATA EC	uS/cm		1390	1300	1370	1410	1420	1400	1410			1460	1370	1420	1430	1440	1450
O2	mg/L		2.8		2.9			9.7									
Phosphate as PO4-P	mg/L																
Phosphorus Total (P)	mg/L		0.083		0.039			0.07									
NATA pH			5.9	5.6	5.6	5.8	5.8	5.6	5.9			6.1	5.9	6	5.8	6.1	6.2
Potassium (K)	mg/L			6.3		6.2	5.3		5.4			4.6	5	5.7	5.4	5.4	6.1
Sodium (Na)	mg/L			226		228	217		225			186	214	236	209	207	229
Sulphate (SO_4^{2-})	mg/L	>44.77	47	43	39	39	38	38	38			42	40	41	40	44	43
TDS	mg/L	>851.7	740	744	679	634	727	728	749			750	780	750	770	770	800
Sulphate:Chloride Ratio		>0.5		0.10	0.10	0.10	0.10	0.09	0.09	#DIV/0!	#DIV/0!	0.10	0.10	0.10	0.10	0.10	0.11
Chloride:Sulphate Ratio		<2.0		9.53	10.51	10.26	10.26	11.05	10.79	#DIV/0!	#DIV/0!	10.21	9.90	9.66	9.68	9.68	9.35

YA_MB04S		Triggers	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20
Date			10/04/2019	8/05/2019	11/06/2019	11/07/2019	12/08/2019	10/09/2019	9/10/2019	12/11/2019	9/12/2019	9/01/2020	10/02/2020	10/03/2020	8/04/2020	7/05/2020	9/06/2020
Casing Height above topo	m	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Depth of bore	m	9.00	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27
SWL (m)	m (from top of casing)		2.45	2.5	2.23	1.21	1.42	1.13	1.49	1.84	2.07	2.22	2.32	2.42			
m AHD			21.12	21.07	21.34	22.36	22.15	22.44	22.08	21.73	21.50	21.35	21.25	21.15			
Purge	L		70	69	72	85	82	86	81	77	74	36	36	35			
Field pH		<5	5.7	5.83	5.82	5.8	5.73	5.77	5.78	5.72	5.7	5.72	5.87	5.62			
Temp	degrees C		20.2	17.9	16.9	16.3	17.9	17.7	18.7	19	19.6	19.4	18.3	19.3			
Field Cond (EC)	uS/cm	>1699.30	1650.00	1580.00	1520.00	1550.00	1580.00	1620.00	1740.00	1670.00	1630.00	1510.00	1500.00	1520.00			
Field Salinity	ppm		830	790	760	780	790	810	870	840	810	760	750	760			
Field ROP	mv		258	333	239	271	337	304	323	280	300	377	323	392			
Field Alkalinity		<25.39	45	42	42	51	48	42	33	42	63	54	45	48			
Field TTA		>174.79	200	140	120	120	135	140	130	130	120	130	120	115			
Field DO %S			16	12.6	13.7	14.9	18.9	17.7	17.7	20.2	20.5	22.6	16.4	14.7			
Comments															NO ACCESS	NO ACCESS	NO ACCESS
Aluminium Filtered (Al)	mg/L	>1	0.016	0.041	0.025	0.015	0.012	0.02	0.018	0.027	0.013	0.015	0.031	0.016			
Aluminium Total (Al)	mg/L				0.47												
Arsenic (As)	mg/L				0.0003												
Arsenic (As) Total	mg/L																
Boron (B)	mg/L																
Cadmium (Cd)	mg/L				<0.0001												
Cadmium (Cd) Total	mg/L																
Chromium (Cr)	mg/L				<0.0001												
Chromium (Cr) Total	mg/L																
Chromium VI (Cr)	mg/L																
Chromium VI (Cr) Total	mg/L																
Cobolt (Co)	mg/L																
Cobolt (Co) Total	mg/L																
Copper (Cu)	mg/L																
Copper (Cu) Total	mg/L																
Iron Filtered (Fe)	mg/L	>13.04	10	10	11	9.3	9.3	11	11	11	11	11	11	11			
Iron Total (Fe)	mg/L				13												
Lead (Pb)	mg/L																
Manganese (Mn)	mg/L	>0.25	0.21	0.2	0.22	0.2	0.2	0.24	0.22	0.23	0.23	0.23	0.23	0.22			
Magnesium (Mg)	mg/L		25.6	24.7		21.7	22.9	27.5	25.4	25.8	24.9	25.9	25.7	24.1			
Mercury (Hg)	mg/L																
Mercury (Hg) Total	mg/L																
Molybdenum (Mo)	mg/L																
Nickel (Ni)	mg/L				0.0005												
Nickel (Ni) Total	mg/L																
Selenium (Se)	mg/L				<0.0002												
Selenium (Se) Total	mg/L																
Uranium (U)	mg/L																
Uranium (U) Total	mg/L																
Zinc (Zn)	mg/L				0.007												
Zinc (Zn) Total	mg/L																
Thallium (Tl)	mg/L																
Thallium (Tl) Total	mg/L																
CaCO3 (Acidity)	mg/L		120	100	77	86	94	45	57	81	100	81	100	92			
CaCO3 (Alkalinity)	mg/L		40	36	33	37	33	20	40	37	37	20	39	37			
Bicarbonate	mg/L		40	36		37	33	20	40	37	37	20	39	37			
Calcium	mg/L		4.6	4.6		3.9	4.3	5	4.6	4.7	4.6	4.6	4.6	4.5			
Carbonate	mg/L																
Ammonia (NH3-N)	mg/L				0.037												
Nitrogen Total (N)	mg/L				0.078												
Chloride (Cl)	mg/L	>435.48	399	399	419	398	416	410	404	427	424	408	416	428			
NATA EC	uS/cm		1440	1450	1460	1450	1480	1450	1460	1470	1450	1400	1430	1430			
O2	mg/L				4.6												
Phosphate as PO4-P	mg/L																
Phosphorus Total (P)	mg/L				0.079												
NATA pH			5.9	6	6	6	6	5.8	6.1	6.1	6.1	5.7	6	6			
Potassium (K)	mg/L		6.2	5.9		5.1	5.2	6.4	5.2	6	6	6.1	6	5.7			
Sodium (Na)	mg/L		231	230		200	211	241	218	229	224	233	225	217			
Sulphate (SO_4^{2-})	mg/L	>44.77	42	40	43	40	41	41	41	40	43	41	41	42			
TDS	mg/L	>851.7	840	780	710	800	680	750	770	730	750	800	830	780			
Sulphate:Chloride Ratio		>0.5	0.11	0.10	0.10	0.10	0.10	0.10	0.10	0.09	0.10	0.10	0.10	0.10	#DIV/0!	#DIV/0!	#DIV/0!
Chloride:Sulphate Ratio		<2.0	9.50	9.98	9.74	9.95	10.15	10.00	9.85	10.68	9.86	9.95	10.15	10.19	#DIV/0!	#DIV/0!	#DIV/0!

YA_MB04S		Triggers	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21
Date			9/07/2020	6/08/2020	8/09/2020	13/10/2020	9/11/2020	8/12/2020	12/01/2021	10/02/2021	11/03/2021	14/04/2021	12/05/2021	9/06/2021	8/07/2021	9/08/2021	6/09/2021
Casing Height above topo	m	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Depth of bore	m	9.00	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27
SWL (m)	m (from top of casing)									2.08	2.15	2.08	1.94	1.59	0.93		
m AHD										21.49	21.42	21.49	21.63	21.98	22.64		
Purge	L									39	37	37	38	40	44		
Field pH		<5								5.84	5.69	5.71	5.96	5.82	5.9		
Temp	degrees C									19.4	20	16.9	17.7	17.3	17.8		
Field Cond (EC)	uS/cm	>1699.30								1540.00	1510.00	1500.00	1560.00	1560.00	1590.00		
Field Salinity	ppm									770	750	750	780	780	790		
Field ROP	mv									368	417	522	397	353	380		
Field Alkalinity		<25.39								48	45	48	45	51	45		
Field TTA		>174.79								110	121	112	98	120	125		
Field DO %S										20.2	20.6	17.6	20.6				
Comments			NO ACCESS	NO ACCESS	NO ACCESS	NO ACCESS	NO ACCESS	NO ACCESS	NO ACCESS							no access	no access
Aluminium Filtered (Al)	mg/L	>1								0.021	0.028	0.025	0.013	0.022	0.021		
Aluminium Total (Al)	mg/L																
Arsenic (As)	mg/L																
Arsenic (As) Total	mg/L																
Boron (B)	mg/L																
Cadmium (Cd)	mg/L																
Cadmium (Cd) Total	mg/L																
Chromium (Cr)	mg/L																
Chromium (Cr) Total	mg/L																
Chromium VI (Cr)	mg/L																
Chromium VI (Cr) Total	mg/L																
Cobolt (Co)	mg/L																
Cobolt (Co) Total	mg/L																
Copper (Cu)	mg/L																
Copper (Cu) Total	mg/L																
Iron Filtered (Fe)	mg/L	>13.04								11	11	11	11	12	10		
Iron Total (Fe)	mg/L																
Lead (Pb)	mg/L																
Manganese (Mn)	mg/L	>0.25								0.22	0.22	0.22	0.23	0.23	0.21		
Magnesium (Mg)	mg/L									25.9	26	26	24.9				
Mercury (Hg)	mg/L																
Mercury (Hg) Total	mg/L																
Molybdenum (Mo)	mg/L																
Nickel (Ni)	mg/L																
Nickel (Ni) Total	mg/L																
Selenium (Se)	mg/L																
Selenium (Se) Total	mg/L																
Uranium (U)	mg/L																
Uranium (U) Total	mg/L																
Zinc (Zn)	mg/L																
Zinc (Zn) Total	mg/L																
Thallium (Tl)	mg/L																
Thallium (Tl) Total	mg/L																
CaCO3 (Acidity)	mg/L									87	93	99	63	87	96		
CaCO3 (Alkalinity)	mg/L									39	40	19	37	21	21		
Bicarbonate	mg/L									39	40	19	37				
Calcium	mg/L									4.9	5	4.8	5				
Carbonate	mg/L																
Ammonia (NH3-N)	mg/L																
Nitrogen Total (N)	mg/L																
Chloride (Cl)	mg/L	>435.48								399	418	414	408	416	420		
NATA EC	uS/cm									1410	1420	1430	1410	1420	1420		
O2	mg/L																
Phosphate as PO4-P	mg/L																
Phosphorus Total (P)	mg/L																
NATA pH										6	6	5.7	6	5.9	5.8		
Potassium (K)	mg/L									6.8	6.5	6.8	7.2				
Sodium (Na)	mg/L									231	226	234	228	231	214		
Sulphate (SO_4^{2-})	mg/L	>44.77								40	41	40	41	41	38		
TDS	mg/L	>851.7								740	740	880	750	750	780		
Sulphate:Chloride Ratio		>0.5	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.10	0.10	0.10	0.10	0.10	0.09	#DIV/0!	#DIV/0!
Chloride:Sulphate Ratio		<2.0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	9.98	10.20	10.35	9.95	10.15	11.05	#DIV/0!	#DIV/0!

YA_MB04S		Triggers	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23
Date			14/10/2021	11/11/2021	14/12/2021	6/01/2022	3/02/2022	8/03/2022	19/04/2022	18/05/2022	23/06/2022	19/07/2022	25/08/2022	14/09/2022	28/10/2022	16/11/2022	14/12/2022	12/01/2023
Casing Height above topo	m	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Depth of bore	m	9.00	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27
SWL (m)	m (from top of casing)			1.47	1.86	1.99	2.1	2.19	2.36	2.4	1.94	1.76			1.92	2.06	2.3	2.4
m AHD				22.10	21.71	21.58	21.47	21.38	21.21	21.17	21.63	21.81			21.65	21.51	21.27	21.17
Purge	L			41	38	38	37	37	36	35	38	40			38	35	30	30
Field pH		<5		5.84	5.85	5.8	5.8	5.72	5.73	5.81	5.89	5.7			5.87	5.72	5.9	5.89
Temp	degrees C			17.7	18.4	19.5	19.1	18	19.2	17.8	18.2	18.7			18.7	18.6	19.7	19.6
Field Cond (EC)	uS/cm	>1699.30		1610.00	1570.00	1600.00	1620.00	1760.00	1590.00	1760.00	1530.00	1700.00			1480.00	1430.00	1520.00	1560.00
Field Salinity	ppm			800	790	800	810	880	730	890	770	870			740	740	760	760
Field ROP	mv			391		405	313	295	354	339	324	342			267	272	220	365
Field Alkalinity		<25.39		36	54	40	54	39	54	36	39	21			30	39	40	36
Field TTA		>174.79		120	124	140	150	160	150	150	85	150			180	190	180	180
Field DO %S																		
Comments			no access										no access	no access				
Aluminium Filtered (Al)	mg/L	>1		0.017	0.026	0.016	0.029	0.026	0.019	0.024	0.041	0.029			0.013	0.027	0.045	0.047
Aluminium Total (Al)	mg/L										0.64						2.8	
Arsenic (As)	mg/L										0.0004						0.0004	
Arsenic (As) Total	mg/L										0.0005						0.0006	
Boron (B)	mg/L																<0.0001	
Cadmium (Cd)	mg/L										<0.0001						<0.0001	
Cadmium (Cd) Total	mg/L										<0.0001						<0.0001	
Chromium (Cr)	mg/L										0.0001						0.0001	
Chromium (Cr) Total	mg/L										0.0012						<0.004	
Chromium VI (Cr)	mg/L										<0.004						<0.004	
Chromium VI (Cr) Total	mg/L										<0.004						0.0014	
Cobolt (Co)	mg/L										0.0001						0.0002	
Cobolt (Co) Total	mg/L										0.0002						0.0003	
Copper (Cu)	mg/L										<0.0001						0.017	
Copper (Cu) Total	mg/L										0.0011						0.0011	
Iron Filtered (Fe)	mg/L	>13.04		10	11	9.6	11	11	11	11	9.5	12			0.044	11	10	11
Iron Total (Fe)	mg/L																12	
Lead (Pb)	mg/L										<0.0001						<0.0001	
Manganese (Mn)	mg/L	>0.25		0.21	0.22	0.2	0.23	0.22	0.23	0.22	0.21	0.25			0.21	0.21	0.21	0.21
Magnesium (Mg)	mg/L				25		25.7	25.3	25.2	25.5	23.8	29.9			24.7	26.3	25.2	27.4
Mercury (Hg)	mg/L										<0.00005						<0.00005	
Mercury (Hg) Total	mg/L										<0.00005						<0.00005	
Molybdenum (Mo)	mg/L																	
Nickel (Ni)	mg/L										<0.0005						0.0006	
Nickel (Ni) Total	mg/L										0.0008						0.001	
Selenium (Se)	mg/L										<0.0002						<0.0002	
Selenium (Se) Total	mg/L										<0.0002						<0.0002	
Uranium (U)	mg/L										<0.0001						<0.0001	
Uranium (U) Total	mg/L										<0.0001						0.0003	
Zinc (Zn)	mg/L										0.002						0.001	
Zinc (Zn) Total	mg/L										0.007						0.007	
Thallium (Tl)	mg/L										<0.0001						<0.0001	
Thallium (Tl) Total	mg/L										<0.0001						<0.0001	
CaCO3 (Acidity)	mg/L			49	94	99	89	88	84	83	110	96			100	70	33	97
CaCO3 (Alkalinity)	mg/L			24	41	21	22	37	40	37	20	34			40	24	37	28
Bicarbonate	mg/L				41	21	22	37	40	37	20	34			40	24	37	28
Calcium	mg/L				4.8	4.6	5.2	4.9	5.1	4.8	4.6	5.6			5.5	5.1	4.9	5.7
Carbonate	mg/L																	
Ammonia (NH3-N)	mg/L																	
Nitrogen Total (N)	mg/L																	
Chloride (Cl)	mg/L	>435.48		394	407	408	403	395	411	409	402	415			389	406	408	405
NATA EC	uS/cm			1740	1430	1420	1470	1470	1470	1460	1430	1440			1370	1440	1410	1390
O2	mg/L																	
Phosphate as PO4-P	mg/L																	
Phosphorus Total (P)	mg/L																	
NATA pH				6.4	5.9	5.8	5.7	6.1	6.2	6	5.8	5.9			6.6	6.3	6.7	5.8
Potassium (K)	mg/L				6.6	5.9	6.4	6.6	6.1	6.2	5.9	6.9			5.9	6.6	6	7.1
Sodium (Na)	mg/L			222	218	218	234	224	224	225	212	262			223	254	221	242
Sulphate (SO_4^{2-})	mg/L	>44.77		39	40	41	41	40	40	40	40	40			40	40	40	40
TDS	mg/L	>851.7		710	680	740	710	710	690	730	740	750			760	690	720	670
Sulphate:Chloride Ratio		>0.5	#DIV/0!	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	#DIV/0!	#DIV/0!	0.10	0.10	0.10	0.10
Chloride:Sulphate Ratio		<2.0	#DIV/0!	10.10	10.18	9.95	9.83	9.88	10.28	10.23	10.05	10.38	#DIV/0!	#DIV/0!	9.73	10.15	10.20	10.13

YA_MB05S		Triggers	#####	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20
Date							21/10/2019	#########	#########	#########	#########	#########	9/04/2020	#########	9/06/2020
Casing Height above topo	m		0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48
Depth of bore	m		8.12	8.12	8.12	8.12	8.12	8.12	8.12	8.12	8.12	8.12	8.12	8.12	8.12
SWL (m)	m (from top of casing)		1.09				1.03	1.18	1.46	1.54	1.63	1.69	1.79	1.39	1.23
m AHD			21.80				21.25	21.1	20.82	20.74	20.65	20.59	20.49	20.89	21.05
Purge	L		> 500				340	333	320	158	156	154	151	162	165
Field pH		<5	6.05				5.71	5.7	5.7	5.72	5.62	5.72	5.49	5.59	5.84
Temp	degrees C		19.1				17.8	18.2	18.9	18.6	19.6	18.6	19.7	17.5	17.1
Field Cond (EC)	uS/cm	>1096.72	#####				1030.00	1020.00	1140.00	960.00	930.00	960.00	930.00	910.00	900.00
Field Salinity	ppm		530				510	510	570	480	460	480	460	450	450
Field ROP	mv						251	255	327	311	345	326	355	283	395
Field Alkalinity		<15.06					24	24	30	24	27	24	27	30	24
Field TTA		>87.52					70	65	60	70	70	105	70	65	50
Field DO %S							23	20.6	22.4	26.3	18.1	15.4	14.9	16.4	15.4
Comments			L9	No Access	No Access	No Access									
Aluminium Filtered (Al)	mg/L	>1	0.005				<0.005	<0.005	<0.005	<0.005	0.008	0.005	0.023	0.009	<0.005
Aluminium Total (Al)	mg/L		0.074												0.01
Arsenic (As)	mg/L		4E-04												0.0004
Arsenic (As) Total	mg/L														
Boron (B)	mg/L														
Cadmium (Cd)	mg/L		<0.0001												<0.0001
Cadmium (Cd) Total	mg/L														
Calcium (Ca)	mg/L														
Chromium (Cr)	mg/L		<0.0001												<0.0001
Chromium (Cr) Total	mg/L														
Chromium VI (Cr)	mg/L														
Chromium VI (Cr) Total	mg/L														
Cobolt (Co)	mg/L														
Cobolt (Co) Total	mg/L														
Copper (Cu)	mg/L														
Copper (Cu) Total	mg/L														
Iron Filtered (Fe)	mg/L	>1.89	1				1.4	1.5	1.4	1.5	1.4	1.5	1.6	1.6	0.86
Iron Total (Fe)	mg/L		1.4												1.3
Lead (Pb)	mg/L														
Manganese (Mn)	mg/L	>0.06	0.06				0.022	0.023	0.023	0.024	0.022	0.024	0.034	0.04	0.058
Magnesium (Mg)	mg/L						16.2	16.3	15.5	16.2	15.3	16	16.3	15.9	
Mercury (Hg)	mg/L														
Mercury (Hg) Total	mg/L														
Molybdenum (Mo)	mg/L														
Nickel (Ni)	mg/L		5E-04												0.0005
Nickel (Ni) Total	mg/L														
Selenium (Se)	mg/L		<0.0002												<0.0002
Selenium (Se) Total	mg/L														
Uranium (U	mg/L														
Uranium (U Total	mg/L														
Zinc (Zn)	mg/L		0.003												0.004
Zinc (Zn) Total	mg/L														
Thallium (Tl)	mg/L														
Thallium (Tl) Total	mg/L														
CaCO3 (Acidity)	mg/L		28				45	47	32	52	49	37	49	50	38
CaCO3 (Alkalinity)	mg/L		21				19	19	17	19	21	17	17	18	20
Bicarbonate	mg/L						19	19	17	19	21	17	17	18	
Calcium	mg/L						3.7	3.7	3.5	3.5	3.3	3.5	3.5	3.6	
Carbonate	mg/L														
Ammonia (NH3-N)	mg/L		<0.010												<0.010
Nitrogen Total (N)	mg/L		<0.025												<0.025
Chloride (Cl)	mg/L	>248.37	235				243	235	241	233	240	240	242	243	233
NATA EC	uS/cm		888				895	884	885	880	882	874	899	876	865
O2	mg/L		4.2												4.7
Phosphate as PO4-P	mg/L														
Phosphorus Total (P)	mg/L		0.008												0.008
NATA pH			6				6	6	6	6	6.1	6	5.9	5.9	6.1
Potassium (K)	mg/L						3.4	4	3.6	3.4	3.3	3.7	3.5	3.8	
Sodium (Na)	mg/L						138	140	133	137	132	136	267	130	
Sulphate (SO_4^{2-})	mg/L	>45.42	41				42	41	41	42	42	42	43	42	42
TDS	mg/L	>528.29	480				480	450	470	490	490	460	500	480	470
Sulphate:Chloride Ratio		>0.5	0.17	#DIV/0!	#DIV/0!	#DIV/0!	0.17	0.17	0.17	0.18	0.18	0.18	0.18	0.17	0.18
Chloride:Sulphate Ratio		<2	5.73	#DIV/0!	#DIV/0!	#DIV/0!	5.79	5.73	5.88	5.55	5.71	5.71	5.63	5.79	5.55

YA_MB05S	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21
Date	9/07/2020	10/08/2020	9/09/2020	13/10/2020	9/11/2020	8/12/2020	13/01/2021	8/02/2021	11/03/2021	15/04/2021	10/05/2021	8/06/2021	7/07/2021	9/08/2021	13/09/2021
Casing Height above topo	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48
Depth of bore	8.12	8.12	8.12	8.12	8.12	8.12	8.12	8.12	8.12	8.12	8.12	8.12	8.12	8.12	8.12
SWL (m)	0.64			0.82	1.08	1.2	1.46	1.46	1.38	1.25	1.11	0.8			
m AHD	21.64			21.46	21.20	21.08	20.82	20.82	20.90	21.03	21.17	21.48			
Purge	180			175	169	166	160	160	161	165	168	176			
Field pH	5.86			5.6	5.62	5.77	5.74	5.82	5.7	5.79	5.79	5.82			
Temp	15.9			16.9	17.7	17.9	17.4	19.2	20.2	20.3	18.4	16.6			
Field Cond (EC)	900.00			940.00	940.00	950.00	930.00	930.00	1060.00	1000.00	950.00	960.00			
Field Salinity	450			470	470	470	460	460	530	500	480	480			
Field ROP	343			317	334	343	396	408	382	440	443	396			
Field Alkalinity	30			30	30	27	30	29	27	30	33	33			
Field TTA	50			65	65	60	60	50	61	64	75	70			
Field DO %S	19.2			8.2	14.1	15.6	14.7	14.4	21.7	15.1	17.6				
Comments													no access	no access	no access
Aluminium Filtered (Al)	0.005			0.007	0.008	<0.005	<0.005	<0.005	0.01	0.007	<0.005	<0.005			
Aluminium Total (Al)															
Arsenic (As)															
Arsenic (As) Total															
Boron (B)															
Cadmium (Cd)															
Cadmium (Cd) Total															
Calcium (Ca)															
Chromium (Cr)															
Chromium (Cr) Total															
Chromium VI (Cr)															
Chromium VI (Cr) Total															
Cobolt (Co)															
Cobolt (Co) Total															
Copper (Cu)															
Copper (Cu) Total															
Iron Filtered (Fe)	1			1.6	1.5	1.5	1.5	1.7	1.7	1.7	1.5	1.6			
Iron Total (Fe)															
Lead (Pb)															
Manganese (Mn)	0.057			0.019	0.02	0.021	0.02	0.0024	0.022	0.049	0.05	0.021			
Magnesium (Mg)	15.6			15.5	15.2	15.7	15.8	16.3	16.8	18.7	16.7				
Mercury (Hg)															
Mercury (Hg) Total															
Molybdenum (Mo)															
Nickel (Ni)															
Nickel (Ni) Total															
Selenium (Se)															
Selenium (Se) Total															
Uranium (U															
Uranium (U Total															
Zinc (Zn)															
Zinc (Zn) Total															
Thallium (Tl)															
Thallium (Tl) Total															
CaCO3 (Acidity)	41			51	43	37	38	44	52	41	41	58			
CaCO3 (Alkalinity)	20			21	17	20	22	19	22	19	19	18			
Bicarbonate	20			21	17	20	22	19	22	19	19				
Calcium	3.6			3.6	3.5	3.8	3.8	3.8	3.9	4.7	4.3				
Carbonate															
Ammonia (NH3-N)															
Nitrogen Total (N)															
Chloride (Cl)	236			240	238	236	243	243	246	242	235	249			
NATA EC	873			891	884	918	884	886	882	910	894	889			
O2															
Phosphate as PO4-P															
Phosphorus Total (P)															
NATA pH	6			6	5.9	6	6.1	6	5.9	6	5.9	5.9			
Potassium (K)	3.7			3.5	3.4	3.4	3.7	3.9	4	4.2	4.4				
Sodium (Na)	136			131	120	127	130	135	145	164	144	134			
Sulphate (SO_4^{2-})	42			46	44	44	45	43	44	43	42	43			
TDS	450			500	490	390	460	480	460	510	440	520			
Sulphate:Chloride Ratio	0.18	#DIV/0!	#DIV/0!	0.19	0.18	0.19	0.19	0.18	0.18	0.18	0.18	0.17	#DIV/0!	#DIV/0!	#DIV/0!
Chloride:Sulphate Ratio	5.62	#DIV/0!	#DIV/0!	5.22	5.41	5.36	5.40	5.65	5.59	5.63	5.60	5.79	#DIV/0!	#DIV/0!	#DIV/0!

YA_MB05S	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23
Date	18/10/2021	9/11/2021	21/12/2021	12\01\2022	3/02/2022	2/03/2022	6/04/2022	11/05/2022	22/06/2022	21/07/2022	11/08/2022	28/09/2022	18/10/2022	16/11/2022	13/12/2022	12/01/2023
Casing Height above topo	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48
Depth of bore	8.12	8.12	8.12	8.12	8.12	8.12	8.12	8.12	8.12	8.12	8.12	8.12	8.12	8.12	8.12	8.12
SWL (m)	0.8	0.9	1.33	1.44	1.51	1.61	1.74	2.12	1.9	1.72	1.24	1.42	2.36	2.67	2.6	2.65
m AHD	21.48	21.38	20.95	20.84	20.77	20.67	20.54	20.16	20.38	20.56	21.04	20.86	19.92	19.61	19.68	19.63
Purge	176	173	163	160	159	156	154	144	150	153	165	161	160	130	130	130
Field pH	5.71	5.77	5.73	5.68	5.57	5.33	5.57	5.7	5.62	5.81	6.1	6.24	6.06	6.08	6.06	6.15
Temp	19.2	18.7	19.2	19.6	20.6	18.1	20.1	19.6	18.4	15.87	15.7	17.6	17	18.8	18.8	19.9
Field Cond (EC)	990	1020	1010	1080	1040	1070	1080	1140	1110	1480	1600	2780.00	2870.00	3470.00	4130.00	4330.00
Field Salinity	500	510	500	540	520	540	540	580	550	740	800	1310	1430	1730	2060	2160
Field ROP	361	391	311	407	370	290	346	300	359	378	373	345	268	320	260	344
Field Alkalinity	18	9	18	45	43	30	26	45	30	36	45	54	63	75	72	78
Field TTA	55	68	68	80	80	75	80	70	65	90	100	100	80	100	110	110
Field DO %S																
Comments																
Aluminium Filtered (Al)	0.007	0.007	0.008	<0.005	0.018	0.029	0.014	0.016	0.009	0.093	0.02	0.005	0.013	0.014	0.014	0.015
Aluminium Total (Al)									0.11			0.018			0.049	
Arsenic (As)									<0.0001			<0.0001			0.0001	
Arsenic (As) Total									0.0002			0.0001			0.0003	
Boron (B)																
Cadmium (Cd)									<0.0001			<0.0001			<0.0001	
Cadmium (Cd) Total									<0.0001			<0.0001			<0.0001	
Calcium (Ca)																
Chromium (Cr)									0.0002			0.0001			0.0004	
Chromium (Cr) Total									0.0006			0.0004			0.0016	
Chromium VI (Cr)									<0.004			<0.004			<0.004	
Chromium VI (Cr) Total									<0.004			<0.004			<0.004	
Cobolt (Co)									0.0008			0.0006			0.0007	
Cobolt (Co) Total									0.0009			0.0006			0.0006	
Copper (Cu)									0.0006			0.01			0.0005	
Copper (Cu) Total									0.0021			0.0012			0.0004	
Iron Filtered (Fe)	1.5	1.5	1.6	1.3	1.7	1.8	1.7	0.21	0.045	0.24	0.072	0.034	0.088	0.11	0.17	0.17
Iron Total (Fe)									0.29			0.06			0.23	
Lead (Pb)									<0.0001			<0.0001			<0.0001	
Manganese (Mn)	0.017	0.016	0.018	0.018	0.02	0.027	0.024	0.047	0.037	0.047	0.04	0.013	0.043	0.041	0.049	0.04
Magnesium (Mg)			17.1	15.2	17.1	16.2	15.8	18	19.5	37.7	33.4	65.3	56.5	71.6	87	99.8
Mercury (Hg)									<0.00005			<0.00005			<0.00005	
Mercury (Hg) Total									<0.00005			<0.00005			<0.00005	
Molybdenum (Mo)																
Nickel (Ni)									0.0009			0.0005			0.0008	
Nickel (Ni) Total									0.0013			<0.0005			<0.0005	
Selenium (Se)									<0.0002			<0.0002			<0.0002	
Selenium (Se) Total									0.0002			<0.0002			<0.0002	
Uranium (U									<0.0001			<0.0001			<0.0001	
Uranium (U Total									0.0002			<0.0001			<0.0001	
Zinc (Zn)									0.003			0.003			0.013	
Zinc (Zn) Total									0.007			<0.005			<0.005	
Thallium (Tl)									<0.0001			<0.0001			<0.0001	
Thallium (Tl) Total									<0.0001			<0.0001			<0.0001	
CaCO3 (Acidity)	57	56	51	81	49	63	53	56	42	48	35	46	46	13	49	51
CaCO3 (Alkalinity)	16	21	21	16	15	20	16	17	27	32	38	41	59	65	69	72
Bicarbonate			21	16	15	20	16	17	27	32	38	41	59	65	69	72
Calcium			3.9	3.7	4.2	4	3.7	4	4.5	8.6	7.1	12.7	10.9	12.5	14.2	18
Carbonate																
Ammonia (NH3-N)																
Nitrogen Total (N)																
Chloride (Cl)	242	242	242	236	239	236	239	243	273	394	408	782	826	980	1210	1290
NATA EC	871	928	913	904	933	919	921	931	1060	1490	1530	2830	2620	3320	3970	4300
O2																
Phosphate as PO4-P																
Phosphorus Total (P)																
NATA pH	6.1	6.1	6.2	6	5.9	6.2	6.2	5.9	6	6.1	6.3	6.2	6.3	7	6.5	6.4
Potassium (K)			4	3.7	3.9	4.5	3.8	3.8	4	6.8	4.8	5.6	5.8	4.9	4.1	5.1
Sodium (Na)	144	142	144	139	146	138	138	153	158	263	260	474	513	579	770	771
Sulphate (SO_4^{2-})	44	44	45	46	46	44	45	47	59	67	75	140	160	180	210	200
TDS	460	480	490	460	440	460	440	440	520	800	740	1500	1500	1900	2000	2100
Sulphate:Chloride Ratio	0.18	0.18	0.19	0.19	0.19	0.19	0.19	0.19	0.22	0.17	0.18	0.18	0.19	0.18	0.17	0.16
Chloride:Sulphate Ratio	5.50	5.50	5.38	5.13	5.20	5.36	5.31	5.17	4.63	5.88	5.44	5.59	5.16	5.44	5.76	6.45

YA_MB06S		Triggers	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19
Date																																19/06/2019			
Casing Height above topo	m																															0.43	0.43	0.43	0.43
Depth of bore	m																															7.86	7.86	7.86	7.86
SWL (m)	m (from top of casing)																															2.08			
m AHD																																21.80			
Purge	L																															> 500 L			
Field pH		<5																														5.58			
Temp	degrees C																															13.3			
Field Cond (EC)	uS/cm	>11940.73																														7730.00			
Field Salinity	ppm																															3870			
Field ROP	mv																																		
Field Alkalinity		<55.07																																	
Field TTA		>69.65																																	
Field DO %S																																			
Comments																																L9	No Access	No Access	No Access
Aluminium Filtered (Al)	mg/L	>1																														0.015			
Aluminium Total (Al)	mg/L																															0.061			
Arsenic (As)	mg/L																															0.001			
Arsenic (As) Total	mg/L																																		
Boron (B)	mg/L																																		
Cadmium (Cd)	mg/L																															<0.0001			
Cadmium (Cd) Total	mg/L																																		
Chromium (Cr)	mg/L																															0.0002			
Chromium (Cr) Total	mg/L																																		
Chromium VI (Cr)	mg/L																																		
Chromium VI (Cr) Total	mg/L																																		
Cobolt (Co)	mg/L																																		
Cobolt (Co) Total	mg/L																																		
Copper (Cu)	mg/L																																		
Copper (Cu) Total	mg/L																																		
Iron Filtered (Fe)	mg/L	>3.64																														0.58			
Iron Total (Fe)	mg/L																															1.2			
Lead (Pb)	mg/L																																		
Manganese (Mn)	mg/L	>0.4																														0.19			
Magnesium (Mg)	mg/L																																		
Mercury (Hg)	mg/L																																		
Mercury (Hg) Total	mg/L																																		
Molybdenum (Mo)	mg/L																																		
Nickel (Ni)	mg/L																															0.0029			
Nickel (Ni) Total	mg/L																																		
Selenium (Se)	mg/L																															0.0003			
Selenium (Se) Total	mg/L																																		
Uranium (U)	mg/L																																		
Uranium (U) Total	mg/L																																		
Zinc (Zn)	mg/L																															0.014			
Zinc (Zn) Total	mg/L																																		
Thallium (Tl)	mg/L																																		
Thallium (Tl) Total	mg/L																																		
CaCO3 (Acidity)	mg/L																															9			
CaCO3 (Alkalinity)	mg/L																															73			
Bicarbonate	mg/L																																		
Calcium	mg/L																																		
Carbonate	mg/L																																		
Ammonia (NH3-N)	mg/L																															<0.010			
Nitrogen Total (N)	mg/L																															1.1			
Chloride (Cl)	mg/L	>3940.53																														2250			
NATA EC	uS/cm																															7620			
O2	mg/L																															6.2			
Phosphate as PO4-P	mg/L																																		
Phosphorus Total (P)	mg/L																															0.009			
NATA pH																																7.3			
Potassium (K)	mg/L																																		
Sodium (Na)	mg/L																																		
Sulphate (SO_4^{2-})	mg/L	>634.46																														400			
TDS	mg/L	>7553.63																														3800			
Eh	mg/L																																		
Radium 226	Bq/L																																		
Radium 228	Bq/L																																		
Sulphate:Chloride Ratio		>0.5																																	
Chloride:Sulphate Ratio		<2.0																																	

YA_MB06S	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20
Date	21/10/2019	########	########	########	########	########	9/04/2020	7/05/2020	9/06/2020	9/07/2020	10/08/2020	9/09/2020
Casing Height above topo	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Depth of bore	7.86	7.86	7.86	7.86	7.86	7.86	7.86	7.86	7.86	7.86	7.86	7.86
SWL (m)	1.71	1.84	2.09	2.24	2.4	2.53	2.48	2.3	2.02	1.39	1.02	1.11
m AHD	20.52	20.39	20.14	19.99	19.83	19.7	19.75	19.93	20.21	20.84	21.21	21.12
Purge	295	289	277	135	131	128	129	133	140	155	164	162
Field pH	6.41	6.35	6.4	6.49	6.45	6.43	6.34	6.14	6.55	6.55	6.31	6.26
Temp	17.8	17.5	18.9	19.1	20.2	19.9	20.8	20.1	17.4	15.6	17.7	16.6
Field Cond (EC)	11750.00	11400.00	10880.00	6840.00	6490.00	7580.00	7770.00	8660.00	9940.00	8870.00	7170.00	8640.00
Field Salinity	5880	5700	5440	3420	3250	3790	3890	4330	4970	4440	3580	4320
Field ROP	304	298	370	365	390	362	450	424	416	364	388	388
Field Alkalinity	81	87	90	75	63	66	69	75	72	84	72	75
Field TTA	65	65	60	50	40	40	36	42	60	50	65	50
Field DO %S	22.7	22.3	24.4	24.2	14.7	15.8	15.4	15.8	15.4	18.8	12.1	20.9
Comments												
Aluminium Filtered (Al)	0.005	0.008	0.006	<0.005	<0.005	<0.005	0.029	0.016	<0.005	0.008	0.12	0.016
Aluminium Total (Al)									0.17			
Arsenic (As)									0.0004			
Arsenic (As) Total												
Boron (B)												
Cadmium (Cd)									<0.0002			
Cadmium (Cd) Total												
Chromium (Cr)									0.0005			
Chromium (Cr) Total												
Chromium VI (Cr)												
Chromium VI (Cr) Total												
Cobolt (Co)												
Cobolt (Co) Total												
Copper (Cu)												
Copper (Cu) Total												
Iron Filtered (Fe)	4.3	5.2	3.8	0.31	0.34	0.24	3.6	0.93	0.79	0.27	0.46	0.59
Iron Total (Fe)									1.3			
Lead (Pb)												
Manganese (Mn)	0.23	0.22	0.43	0.19	0.11	0.1	0.57	0.3	0.26	0.19	0.14	0.17
Magnesium (Mg)	204	225	203	71	82.4	78.8	116	183		140	113	148
Mercury (Hg)												
Mercury (Hg) Total												
Molybdenum (Mo)												
Nickel (Ni)									0.0033			
Nickel (Ni) Total												
Selenium (Se)									<0.0004			
Selenium (Se) Total												
Uranium (U)												
Uranium (U) Total												
Zinc (Zn)									0.013			
Zinc (Zn) Total												
Thallium (Tl)												
Thallium (Tl) Total												
CaCO3 (Acidity)	37	43	30	26	26	20	30	42	31	22	32	24
CaCO3 (Alkalinity)	75	78	71	66	67	67	72	72	71	68	67	66
Bicarbonate	75	78	71	66	67	67	72	72		68	67	66
Calcium	13.3	13.7	13.4	6.5	5.5	5.4	8.8	11.2		12.7	18.7	22.4
Carbonate												
Ammonia (NH3-N)									<0.010			
Nitrogen Total (N)									0.28			
Chloride (Cl)	3750	3760	3670	1980	1960	2230	2330	3430	3130	2730	2150	2650
NATA EC	12100	11700	11600	6430	6360	7110	7730	10800	9990	8780	7070	8600
O2									5.3			
Phosphate as PO4-P												
Phosphorus Total (P)									<0.005			
NATA pH	6.6	6.6	6.6	6.7	6.7	6.7	6.7	6.5	6.6	6.7	6.6	6.8
Potassium (K)	3.1	4.8	4	2.1	2	2.1	3.1	4.4		3.1	7.8	7.9
Sodium (Na)	2100	2390	2180	1070	1140	1110	1380	2090		1550	1330	1620
Sulphate (SO_4^{2-})	600	590	550	360	360	400	390	560	530	460	370	440
TDS	6700	7100	6900	3500	3500	4200	4500	6700	6100	5300	3900	4900
Eh												
Radium 226												
Radium 228												
Sulphate:Chloride Ratio										0.17	0.17	0.17
Chloride:Sulphate Ratio										5.93	5.81	6.02

YA_MB06S	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21
Date	13/10/2020	9/11/2020	8/12/2020	13/01/2021	8/02/2021	11/03/2021	15/04/2021	10/05/2021	8/06/2021	7/07/2021	9/08/2021	13/09/2021
Casing Height above topo	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Depth of bore	7.86	7.86	7.86	7.86	7.86	7.86	7.86	7.86	7.86	7.86	7.86	7.86
SWL (m)	1.45	1.7	1.76	2.05	2.07	2.11	2.09	1.97	1.53	0.95		
m AHD	20.78	20.53	20.47	20.18	20.16	20.12	20.14	20.26	20.70	21.28		
Purge	154	148	146	139	139	138	138	141	152	165		
Field pH	6.35	6.47	6.4	6.43	6.4	6.43	6.25	6.4	6.35	6.41		
Temp	16.9	17.2	18.2	17.9	19.8	21.4	20.9	19.4	16.3	16.8		
Field Cond (EC)	10320.00	10320.00	10020.00	5850.00	4890.00	5280.00	8920.00	8800.00	8760.00	5480.00		
Field Salinity	5160	5160	5010	2630	2440	2640	4460	4400	4380	2740		
Field ROP	373	373	387	425	437	427	506	461	446	462		
Field Alkalinity	93	84	90	93	63	75	66	90	90	70		
Field TTA	60	60	55	40	33	25	45	50	45	63		
Field DO %S	9.1	19.4	19.3	17.7	14.2	21.4	12.7	17.9				
Comments											no access	no access
Aluminium Filtered (Al)	0.006	0.6	<0.005	<0.005	<0.005	0.009	0.007	<0.005	<0.005	0.017		
Aluminium Total (Al)												
Arsenic (As)												
Arsenic (As) Total												
Boron (B)												
Cadmium (Cd)												
Cadmium (Cd) Total												
Chromium (Cr)												
Chromium (Cr) Total												
Chromium VI (Cr)												
Chromium VI (Cr) Total												
Cobolt (Co)												
Cobolt (Co) Total												
Copper (Cu)												
Copper (Cu) Total												
Iron Filtered (Fe)	1	1.3	0.78	0.5	0.07	0.37	0.46	0.66	0.58	15		
Iron Total (Fe)												
Lead (Pb)												
Manganese (Mn)	0.2	0.23	0.24	0.098	0.056	0.077	0.18	0.12	0.13	0.61		
Magnesium (Mg)	171	173	161	60.8	67.4	68.1	154	151				
Mercury (Hg)												
Mercury (Hg) Total												
Molybdenum (Mo)												
Nickel (Ni)												
Nickel (Ni) Total												
Selenium (Se)												
Selenium (Se) Total												
Uranium (U)												
Uranium (U) Total												
Zinc (Zn)												
Zinc (Zn) Total												
Thallium (Tl)												
Thallium (Tl) Total												
CaCO3 (Acidity)	30	28	26	17	19	23	27	25	33	16		
CaCO3 (Alkalinity)	76	71	75	63	58	58	68	72	69	56		
Bicarbonate	76	71	74	63	58	58	68	72				
Calcium	12.6	11.7	16.3	9.9	8.8	13.3	18.8	17.4				
Carbonate												
Ammonia (NH3-N)												
Nitrogen Total (N)												
Chloride (Cl)	3170	3240	3020	1570	1420	1580	2760	2680	2850	1610		
NATA EC	10100	10100	9850	5270	4710	5440	8990	8900	9100	5280		
O2												
Phosphate as PO4-P												
Phosphorus Total (P)												
NATA pH	6.6	6.7	6.7	6.9	6.7	6.7	6.7	6.7	6.7	6.9		
Potassium (K)	4.8	4.6	5	3.2	2.9	2.4	4.8	4.8				
Sodium (Na)	1830	1850	1790	917	901	711	1670	1680	1810	267		
Sulphate (SO_4^{2-})	540	560	520	280	250	290	460	450	460	58		
TDS	6600	6300	5400	2900	2600	2800	4700	5000	5100	1000		
Eh												
Radium 226												
Radium 228												
Sulphate:Chloride Ratio	0.17	0.17	0.17	0.18	0.18	0.18	0.17	0.17	0.16	0.04	#DIV/0!	#DIV/0!
Chloride:Sulphate Ratio	5.87	5.79	5.81	5.61	5.68	5.45	6.00	5.96	6.20	27.76	#DIV/0!	#DIV/0!

YA_MB06S	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23
Date	18/10/2021	9/11/2021	21/12/2021	12/01/2022	8/02/2022	2/03/2022	7/04/2024	11/05/2022	15/06/2022	21/07/2022	10/08/2022	13/09/2022	20/10/2022	10/11/2022	1/12/2022	10/01/2023
Casing Height above topo	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Depth of bore	7.86	7.86	7.86	7.86	7.86	7.86	7.86	7.86	7.86	7.86	7.86	7.86	7.86	7.86	7.86	7.86
SWL (m)	1.43	1.48	1.88	2.06	2.3	2.38	2.53	2.63	1.9	1.1	0.8	0.95	1.43	1.48	1.56	1.8
m AHD	20.80	20.75	20.35	20.17	19.93	19.85	19.70	19.60	20.33	21.13	21.43	21.28	20.80	20.75	20.67	20.43
Purge	154	153	144	139	134	131	127	128	190	162	170	165	157	153	150	130
Field pH	6.4	6.42	6.39	6.24	6.32	6.32	6.43	6.36	6.65	6.41	6.48	6.17	5.9	6.18	6.37	6.36
Temp	18	17.8	18.5	21.5	20.3	18.1	19.6	19.3	18.6	17.4	18.7	16.2	17	18.1	17.2	19.8
Field Cond (EC)	8450.00	6770.00	6580.00	6900.00	6740.00	6010.00	9190.00	9480.00	7140.00	3110.00	2430.00	2690.00	2820.00	2670.00	2510.00	2240.00
Field Salinity	4220	3380	3290	3470	3270	3050	4590	4850	3670	1600	1220	1350	1410	1340	1260	1110
Field ROP	411	454	338	437	408	372	420	360	388	395	342	334	324	340	319	326
Field Alkalinity	63	63	63	75	66	66	72	75	66	55	66	46	48	45	48	60
Field TTA	40	45	35	36	45	60	70	50	28	20	30	60	58	40	50	50
Field DO %S																
Comments																
Aluminium Filtered (Al)	0.017	0.033	0.011	<0.005	0.023	0.011	0.014	0.025	0.005	0.031	0.055	0.093	0.014	0.037	0.04	0.038
Aluminium Total (Al)									0.056			0.26				0.6
Arsenic (As)									0.0003			<0.0001				0.0001
Arsenic (As) Total									0.0008			0.0002				0.0003
Boron (B)																
Cadmium (Cd)									<0.0001			<0.0001				<0.0001
Cadmium (Cd) Total									<0.0001			<0.0001				<0.0001
Chromium (Cr)									0.0002			<0.0002				0.0005
Chromium (Cr) Total									0.0002			0.0003				0.0012
Chromium VI (Cr)									<.004			<0.004				<0.004
Chromium VI (Cr) Total									<.001			0.0004				<0.004
Cobolt (Co)									0.0005			0.0003				0.0005
Cobolt (Co) Total									0.0005			0.0003				0.0007
Copper (Cu)									0.0004			0.0011				0.0014
Copper (Cu) Total									0.0004			0.0013				0.0005
Iron Filtered (Fe)	0.7	0.48	0.17	0.16	0.18	0.99	0.92	2.4	0.006	0.042	0.095	0.38	0.017	0.068	0.047	0.1
Iron Total (Fe)									0.48			0.44				0.51
Lead (Pb)									<.0001			<0.0001				<0.0001
Manganese (Mn)	0.15	0.089	0.069	0.042	0.053	0.17	0.15	0.17	0.048	0.014	0.03	0.037	0.036	0.014	0.02	0.02
Magnesium (Mg)			98.3	88.2	98.5	178	143	159	112	50.3	33.1	39.2	30.5	25.6	22.4	23.2
Mercury (Hg)									<.00005			<0.00005				<0.00005
Mercury (Hg) Total									<.00005			<0.00005				<0.00005
Molybdenum (Mo)																
Nickel (Ni)									0.0008			<0.0011				0.0009
Nickel (Ni) Total									0.0008			<0.0005				0.0011
Selenium (Se)									<.0002			<0.0011				0.0003
Selenium (Se) Total									<.0002			0.0002				0.0004
Uranium (U)									0.0001			0.0001				0.0002
Uranium (U) Total									0.0001							<0.0001
Zinc (Zn)									0.002			<0.002				0.005
Zinc (Zn) Total									<.005			<0.005				<0.005
Thallium (Tl)									<.0001			<0.0001				<0.0001
Thallium (Tl) Total									<.0001			<0.0001				<0.0001
CaCO3 (Acidity)	33	35	29	17	10	33	33	39	33	20	27	26	29	30	12	23
CaCO3 (Alkalinity)	65	62	69	60	62	69	70	75	65	44	33	42	42	39	43	49
Bicarbonate			69	60	62	69	70	75	65	44	33	42	42	39	43	49
Calcium			9.4	8	11.9	11.6	10	10.1	8.1	17.6	21.8	28.6	20.4	41.4	39.3	37.5
Carbonate																
Ammonia (NH3-N)																
Nitrogen Total (N)																
Chloride (Cl)	2560	1940	2070	1920	1730	3010	3320	3190	2260	1010	608	814	764	706	669	547
NATA EC	8390	6720	7010	6500	5860	10200	10900	10500	7280	3580	2240	2890	2530	2540	2360	2220
O2																
Phosphate as PO4-P																
Phosphorus Total (P)																
NATA pH	6.9	6.8	7	6.8	6.8	6.9	7.2	6.6	6.8	6.6	6.4	6.5	6.5	7	7.2	6.6
Potassium (K)			4.4	3.3	4.1	5.2	4.1	4.7	2.9	6.2	8	4.1	2.5	2.8	2.1	2
Sodium (Na)	1700	1250	1240	1180	1290	2090	1820	1980	1520	738	438	553	523	422	393	405
Sulphate (SO_4^{2-})	420	330	350	340	300	510	560	530	370	170	120	160	180	190	210	180
TDS	5600	3200	3900	3300	2900	6000	5800	5200	4000	1800	1100	1600	1500	1300	1300	1100
Eh									485			390				378
Radium 226									0.02			0.05				<0.01
Radium 228									<0.08			0.17				<0.08
Sulphate:Chloride Ratio	0.16	0.17	0.17	0.18	0.17	0.17	0.17	0.17	0.16	0.17	0.20	0.20	0.24	0.27	0.31	0.33
Chloride:Sulphate Ratio	6.10	5.88	5.91	5.65	5.77	5.90	5.93	6.02	6.11	5.94	5.07	5.09	4.24	3.72	3.19	3.04

Installed December 2017-located in NW of Lot1426 (Bashford's) . Superficial aquifer only. Screens at 2-8m

YA_MB07S		Triggers	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18
Date														19/12/2017	11/01/2018	12/02/2018	12/03/2018	12/04/2018	8/05/2018	12/06/2018	10/07/2018
Casing Height above topo	m	0.79		0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Depth of bore	m	8.05		8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05
SWL (m)	m (from top of casing)													3.3	3.32	3.41	3.58	3.73	3.83	2.36	1.79
m AHD														22.53	22.51	22.42	22.25	22.10	22.00	23.47	24.04
Purge	L														57	56	54	52	51	68	75
Field pH		<5													5.48	5.49	5.41	5.25	5.26	5.6	5.38
Temp	degrees C														18.4	20.1	20.9	19.5	18.3	16.9	15.8
Field Cond (EC)	uS/cm	>521.24													430.00	390.00	390.00	390.00	390.00	410.00	450.00
Field Salinity	ppm														210	200	200	200	190	210	220
Field ROP	mv														283	268	344	307	311	274	383
Field Alkalinity		<7.78													24	24	39	24	18	12	18
Field TTA		>63.22													43	50	65	60	55	44	40
Field DO %S															9.7	8.2	7.7		7.8	11.5	11.7
Comments														Dip Only							
Aluminium Filtered (Al)	mg/L	>1													0.017	0.017	0.055	<0.005	0.048	0.17	0.011
Aluminium Total (Al)	mg/L														0.67		10			19	
Arsenic (As)	mg/L														<0.0001		<0.0001			<0.0001	
Arsenic (As) Total	mg/L																				
Boron (B)	mg/L																				
Cadmium (Cd)	mg/L														<0.0001		<0.0001			<0.0001	
Cadmium (Cd) Total	mg/L																				
Calcium (Ca)	mg/L																				
Chromium VI (Cr)	mg/L														<0.0001		<0.0001			<0.0001	
Chromium VI (Cr) Total	mg/L																				
Chromium (Cr)	mg/L																				
Chromium Total (Cr)	mg/L																				
Cobolt (Co)	mg/L																				
Cobolt (Co) Total	mg/L																				
Copper (Cu)	mg/L																				
Copper (Cu) Total	mg/L																				
Iron Filtered (Fe)	mg/L	>0.27													0.13	0.15	0.22	0.19	0.38	0.13	0.076
Iron Total (Fe)	mg/L														0.33		2.6			23	
Lead (Pb)	mg/L																				
Manganese (Mn)	mg/L	>0.02													0.011	0.011	0.012	0.008	0.014	0.009	0.007
Magnesium (Mg)	mg/L															11.3		9.3	10.1		12.7
Mercury (Hg)	mg/L																				
Mercury (Hg) Total	mg/L																				
Molybdenum (Mo)	mg/L																				
Nickel (Ni)	mg/L														<0.0005		<0.0005			<0.0005	
Nickel (Ni) Total	mg/L																				
Selenium (Se)	mg/L														<0.0002		<0.0002			<0.0002	
Selenium (Se) Total	mg/L																				
Uranium (U	mg/L																				
Uranium (U Total	mg/L																				
Zinc (Zn)	mg/L														0.006		0.005			0.001	
Zinc (Zn) Total	mg/L																				
Thallium (Tl)	mg/L																				
Thallium (Tl) Total	mg/L																				
CaCO3 (Acidity)	mg/L														33	24	31	33	29	26	26
CaCO3 (Alkalinity)	mg/L														12	11	11	13	11	13	12
Bicarbonate	mg/L															11		13	11		12
Calcium	mg/L															2.9		2.5	2.6		3.2
Carbonate	mg/L																				
Ammonia (NH3-N)	mg/L														<0.010		<0.010			<0.010	
Nitrogen Total (N)	mg/L														8.2		7.5			7.8	
Chloride (Cl)	mg/L	>95.38													62	62	55	65	64	63	72
NATA EC	uS/cm														340	341	344	351	347	363	356
O2	mg/L														3.2		2.9			3.4	
Phosphate as PO4-P	mg/L																				
Phosphorus Total (P)	mg/L														0.014		<0.005			0.024	
NATA pH															5.8	5.9	5.7	5.7	5.7	5.8	5.8
Potassium (K)	mg/L															3.2		2.5	2.9		3.1
Sodium (Na)	mg/L															38.7		33.7	33.9		39.9
Sulphate (SO_4^{2-})	mg/L	>30.27													29	30	28	28	28	28	28
TDS	mg/L	>252.54													202	198	172	172	199	155	197
Eh	mV																				
Radium 226																					
Radium 228																					
Acrylamide																					
Sulphate:Chloride Ratio		>0.53													0.47	0.48	0.51	0.43	0.44	0.44	0.39
Chloride:Sulphate Ratio		<1.54													2.14	2.07	1.96	2.32	2.29	2.25	2.57

YA_MB07S	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
Date	9/08/2018	10/09/2018	10/10/2018	8/11/2018	6/12/2018	9/01/2019	7/02/2019	12/03/2019	9/04/2019	7/05/2019	10/06/2019	9/07/2019	8/08/2019	9/09/2019	8/10/2019	7/11/2019	10/12/2019
Casing Height above topo	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Depth of bore	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05
SWL (m)			2.01	2.45	2.89	3.22	3.45	3.62	3.76	3.88	3.83	2.25	2.26	1.99	2.43	2.87	3.28
m AHD			23.82	23.38	22.94	22.61	22.38	22.21	22.07	21.95	22.00	23.58	23.57	23.84	23.40	22.96	22.55
Purge			72	67	62	58	55	53	51	50	51	70	69	73	67	62	57
Field pH			5.52	5.46	5.48	5.17	5.42	5.39	5.46	5.6	5.65	5.67	5.64	5.7	5.69	5.62	5.56
Temp			17.2	17.8	17.8	20.5	20.3	19.7	19.5	19.3	17.4	17.2	15.7	16.2	16.4	17.3	18
Field Cond (EC)			430.00	440.00	420.00	410.00	450.00	420.00	440.00	390.00	380.00	410.00	430.00	430.00	470.00	420.00	480.00
Field Salinity			210	220	210	200	230	210	220	190	190	210	210	210	230	210	240
Field ROP			251	239	207	291	267	238	278	291	320	276	240	275	256	267	296
Field Alkalinity			15	15	15	21	21	24	21	18	18	21	18	15	15	15	15
Field TTA			45	40	50	60	60	65	50	50	45	45	32	50	40	40	40
Field DO %S			14	14.7	15	18.3	13.8	13.8	15.7	16.9	15.4	15.1	15.7	16.9	17.5	19.2	21.1
Comments	No Access	No Access															
Aluminium Filtered (Al)			0.013	0.008	0.021	0.01	0.01	<0.005	0.007	<0.005	0.017	0.009	0.006	<0.005	0.006	0.006	<0.005
Aluminium Total (Al)											0.063						
Arsenic (As)											<0.0001						
Arsenic (As) Total																	
Boron (B)																	
Cadmium (Cd)											<0.0001						
Cadmium (Cd) Total																	
Calcium (Ca)																	
Chromium VI (Cr)											<0.0001						
Chromium VI (Cr) Total																	
Chromium (Cr)																	
Chromium Total (Cr)																	
Cobolt (Co)																	
Cobolt (Co) Total																	
Copper (Cu)																	
Copper (Cu) Total																	
Iron Filtered (Fe)			0.1	0.042	0.091	0.068	0.065	0.069	0.055	0.1	0.026	0.11	0.17	0.11	0.084	0.082	0.091
Iron Total (Fe)											0.027						
Lead (Pb)																	
Manganese (Mn)			0.007	0.005	0.009	0.006	0.007	0.008	0.005	0.008	0.006	0.008	0.008	0.006	0.006	0.006	0.007
Magnesium (Mg)			11.9	10.6	12.3	10.3	12.6	11.9	9.2	11.5		11.7	12.1	13.5	12	12.3	11
Mercury (Hg)																	
Mercury (Hg) Total																	
Molybdenum (Mo)																	
Nickel (Ni)											<0.0005						
Nickel (Ni) Total																	
Selenium (Se)											<0.0002						
Selenium (Se) Total																	
Uranium (U																	
Uranium (U Total																	
Zinc (Zn)											0.005						
Zinc (Zn) Total																	
Thallium (Tl)																	
Thallium (Tl) Total																	
CaCO3 (Acidity)			18	33	28	23	23	16	38	19	37	26	28	27	16	29	26
CaCO3 (Alkalinity)			10	11	10	11	11	11	11	11	11	12	11	11	11	11	10
Bicarbonate			10	11	10	11	11	11	11	11		12	11	11	11	11	10
Calcium			3.2	2.9	3	2.6	3.3	3.3	2.5	3.1		3.2	3.3	3.7	3.2	3.3	3
Carbonate																	
Ammonia (NH3-N)											<0.010						
Nitrogen Total (N)											7.6						
Chloride (Cl)			57	71	63	59	62	61	61	62	62	60	61	62	62	62	64
NATA EC			357	347	351	353	350	349	344	349	343	364	361	377	359	378	362
O2											4.4						
Phosphate as PO4-P																	
Phosphorus Total (P)											<0.005						
NATA pH			5.8	5.7	5.7	6	6	6.2	5.8	6.1	6	6.1	5.9	5.9	6	5.9	5.9
Potassium (K)			3.1	2.8	3.4	2.9	3.7	3.8	2.8	3.4		3.5	3.6	3.7	3.3	3.3	3.2
Sodium (Na)			40	35.7	39.9	35.3	38.7	37.5	34	38.6		43.2	42.1	44.7	39.7	41.7	37.8
Sulphate (SO_4^{2-})			28	24	27	28	28	29	28	27	28	29	29	28	28	27	27
TDS			210	180	190	190	180	230	180	160	150	180	190	210	180	180	180
Eh																	
Radium 226																	
Radium 228																	
Acrylamide																	
Sulphate:Chloride Ratio	#DIV/0!	#DIV/0!	0.49	0.34	0.43	0.47	0.45	0.48	0.46	0.44	0.45	0.48	0.48	0.45	0.45	0.44	0.42
Chloride:Sulphate Ratio	#DIV/0!	#DIV/0!	2.04	2.96	2.33	2.11	2.21	2.10	2.18	2.30	2.21	2.07	2.10	2.21	2.21	2.30	2.37

YA_MB07S	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21
Date	9/01/2020	10/02/2020	9/03/2020	8/04/2020	7/05/2020	8/06/2020	8/07/2020	6/08/2020	7/09/2020	12/10/2020	5/11/2020	7/12/2020	12/01/2021	4/02/2021	9/03/2021	15/04/2021	6/05/2021
Casing Height above topo	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Depth of bore	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05
SWL (m)	3.5	3.69	3.83	4.16	4.34	3.7	2.91	2.04	1.89	2.35	2.73	2.9	3.28	3.47	3.53	3.6	3.45
m AHD	22.33	22.14	22.00	21.67	21.49	22.13	22.92	23.79	23.94	23.48	23.10	22.93	22.55	22.36	22.30	22.23	22.38
Purge	27	26	25	23	22	26	31	36	37	34	32	31	29	27	27	27	28
Field pH	5.56	5.6	5.52	5.33	5.47	5.4	5.67	5.53	5.54	5.56	5.58	5.69	5.4	5.4	5.4	5.54	5.55
Temp	18.7	20.2	20.6	21.3	18.4	18.6	16.3	16	16	17.1	16.3	17.8	18.1	19.3	19.3	18.4	19.6
Field Cond (EC)	390.00	400.00	390.00	410.00	410.00	390.00	410.00	440.00	440.00	420.00	430.00	470.00	440.00	450.00	480.00	490.00	490.00
Field Salinity	190	200	190	200	200	200	200	220	220	210	210	230	220	220	280	250	250
Field ROP	321	341	390	405	409	384	380	376	391	368	416	391	373	417	410	456	407
Field Alkalinity	18	15	18	21	24	21	18	18	21	21	18	21	27	30	18	21	21
Field TTA	40	40	45	62	65.000	55	50	45	40	45	40	45	40.000	40	35	47	45
Field DO %S	22.7	16	13.9	12.8	12.9	13.4	16.4	16.9	14.4	13.5	19.3	16.9	18.2	16.3	18.2	17.3	15.6
Comments																	
Aluminium Filtered (Al)	0.006	0.008	0.01	0.012	0.016	<0.005	0.008	0.009	<0.005	<0.005	<0.005	<0.005	<0.005	0.023	<0.005	0.013	<0.005
Aluminium Total (Al)						0.14											
Arsenic (As)						<0.0001											
Arsenic (As) Total																	
Boron (B)																	
Cadmium (Cd)						<0.0001											
Cadmium (Cd) Total																	
Calcium (Ca)																	
Chromium VI (Cr)						<0.0001											
Chromium VI (Cr) Total																	
Chromium (Cr)																	
Chromium Total (Cr)																	
Cobolt (Co)																	
Cobolt (Co) Total																	
Copper (Cu)																	
Copper (Cu) Total																	
Iron Filtered (Fe)	0.087	0.13	0.15	0.25	0.340	0.16	0.24	0.16	0.12	0.09	0.11	0.11	0.110	0.21	0.05	0.26	0.19
Iron Total (Fe)						0.024											
Lead (Pb)																	
Manganese (Mn)	0.008	0.011	0.012	0.014	0.020	0.012	0.006	0.009	0.008	0.007	0.007	0.007	0.006	0.01	0.01	0.028	0.015
Magnesium (Mg)	11.2	11.8	12.1	11.4	10.6		13.1	15.1	14.6	13.5	13.3	13.3	10.8	14.1	15.5	13.3	16.2
Mercury (Hg)																	
Mercury (Hg) Total																	
Molybdenum (Mo)																	
Nickel (Ni)						<0.0005											
Nickel (Ni) Total																	
Selenium (Se)						<0.0002											
Selenium (Se) Total																	
Uranium (U																	
Uranium (U Total																	
Zinc (Zn)						0.003											
Zinc (Zn) Total																	
Thallium (Tl)																	
Thallium (Tl) Total																	
CaCO3 (Acidity)	32	31	32	32	32	31	35	31	30	28	23	27	28	25	33	29	36
CaCO3 (Alkalinity)	12	13	13	12	11	12	13	12	12	11	11	13	15	37	12	9	10
Bicarbonate	12	13	13	12	11		13	12	12	11	11	13	15	37	12	9	10
Calcium	2.9	3.1	3.3	3	2.8		3.6	4.2	4.1	3.7	3.7	3.9	2.9	3.9	4.3	4.2	4.7
Carbonate																	
Ammonia (NH3-N)						<0.010											
Nitrogen Total (N)						7.9											
Chloride (Cl)	63	69	70	75	74	73	76	83	82	76	77	79	85	89	87	92	94
NATA EC	359	361	363	372	393	372	393	426	425	401	399	406	419	416	428	446	449
O2						4.8											
Phosphate as PO4-P																	
Phosphorus Total (P)						<0.005											
NATA pH	5.9	6	5.9	6	5.9	5.9	5.9	5.9	5.9	5.9	6	6	6	6	5.9	6	5.8
Potassium (K)	3.2	3.5	3.6	3.5	3.7		4	4.3	3.7	3.6	3.6	3.4	3	4.1	4.6	4.4	4.5
Sodium (Na)	41	43.5	44.6	44.9	43.6		49.7	47.7	51.8	44.3	44.3	40.9	34.2	50.2	47.4	51.8	49.4
Sulphate (SO_4^{2-})	26	26	25	25	25	26	27	30	30	29	28	27	27	25	27	25	26
TDS	190	210	240	190	200	200	190	210	220	200	200	140	200	210	230	260	210
Eh																	
Radium 226														<0.01			
Radium 228														<0.08			
Acrylamide																	
Sulphate:Chloride Ratio	0.41	0.38	0.36	0.33	0.34	0.36	0.36	0.36	0.37	0.38	0.36	0.34	0.32	0.28	0.31	0.27	0.28
Chloride:Sulphate Ratio	2.42	2.65	2.80	3.00	2.96	2.81	2.81	2.77	2.73	2.62	2.75	2.93	3.15	3.56	3.22	3.68	3.62

YA_MB07S	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23
Date	3/06/2021	6/07/2021	9/08/2021	6/09/2021	14/10/2021	4/11/2021	13/12/2021	12/01/2022	3/02/2022	2/03/2022	5/04/2022	11/05/2022	22/06/2022	21/07/2022	11/08/2022	20/09/2022	18/10/2022	16/11/2022	13/12/2022	11/01/2023
Casing Height above topo	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Depth of bore	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05	8.05
SWL (m)	2.99	2.3			2	2.21	2.82	3.15	3.33	3.54	3.75	3.92	3.29	2.97	1.53	1.89	2.41	2.85	3.23	3.5
m AHD	22.84	23.53			23.83	23.62	23.01	22.68	22.50	22.29	22.08	21.91	22.54	22.86	24.30	23.94	23.42	22.98	22.60	22.33
Purge	30	35			36	35	31	29	29	27	26	25	30	31	39	40	34	30	30	30
Field pH	5.66	5.46			5.68	5.77	5.64	5.35	5.55	5.72	5.59	5.61	5.61	5.59	5.91	5.61	5.7	5.91	5.69	5.81
Temp	17.7	17.6			16.6	17	17.3	20.4	21.1	18	20.2	19.4	18.6	17.2	16.5	16.7	17.7	19.4	18.3	19.4
Field Cond (EC)	520.00	550.00			520.00	550.00	550.00	590.00	630.00	590.00	650.00	630.00	520.00	520.00	680.00	530.00	500.00	540.00	520.00	520.00
Field Salinity	260	270			260	280	280	290	310	300	310	320	360	260	340	260	250	260	260	260
Field ROP	402	410			337	399	187	396	343	295	306	395	328	359	359	301	366	260	260	362
Field Alkalinity	24	21			15	3	21	33	45	36	20	30	20	30	36	34	24	36	45	30
Field TTA	45	40			36	35	35	42	50	50	45	46	30	73	40	40	55	60	50	60
Field DO %S																				
Comments			no access	no access																
Aluminium Filtered (Al)	<0.005	0.01			0.009	0.007	0.006	<0.005	0.01	0.016	0.025	0.015	0.022	0.013	0.034	0.008	0.012	0.007	0.017	0.015
Aluminium Total (Al)							0.074						0.12			0.003			0.064	
Arsenic (As)	<0.0001						<0.0001						<0.0001			<0.0001			<0.0001	
Arsenic (As) Total													<0.0001			<0.0001			0.0001	
Boron (B)																				
Cadmium (Cd)	<0.0001						<0.0001						<0.0001			<0.0001			<0.0001	
Cadmium (Cd) Total													<0.0001			<0.0001			<0.0001	
Calcium (Ca)																				
Chromium VI (Cr)	<0.0001						<0.0004						<0.004			<0.004			<0.004	
Chromium VI (Cr) Total													<0.004			<0.004			<0.004	
Chromium (Cr)													<0.0001			<0.0001			0.0001	
Chromium Total (Cr)							0.0002						0.0002			0.0003			0.0003	
Cobolt (Co)	0.0001						0.0002						0.0002			0.0002			0.0002	
Cobolt (Co) Total													0.0005			0.0002			0.0002	
Copper (Cu)	0.0001						0.0037						0.0001			0.0002			0.0011	
Copper (Cu) Total													0.0003			0.0002			0.0004	
Iron Filtered (Fe)	0.21	0.18			0.069	0.012	0.023	0.051	0.062	0.058	0.25	0.043	0.092	0.037	0.045	0.039	0.032	0.048	0.1	0.054
Iron Total (Fe)							0.054						0.14			0.043			0.16	
Lead (Pb)													<0.0001			<0.0001			<0.0001	
Manganese (Mn)	0.008	0.011			0.013	0.009	0.01	0.01	0.016	0.012	0.032	0.012	0.018	0.012	0.01	0.0089	0.007	0.011	0.013	0.007
Magnesium (Mg)							18.9	17.4	18.9	19	19.3	19.3	17.6	21.9	20.2	19.9	17.5	18.7	18.1	20
Mercury (Hg)	<0.00005						<0.00005						<0.00005			<0.00005			<0.00005	
Mercury (Hg) Total													<0.00005			<0.00005			<0.00005	
Molybdenum (Mo)																				
Nickel (Ni)	<0.0005						<0.0005						<0.0005			<0.0005			0.0006	
Nickel (Ni) Total													0.0006			<0.0005			0.0005	
Selenium (Se)	<0.0002						<0.0002						<0.0002			<0.0002			<0.0002	
Selenium (Se) Total													<0.0002			<0.0002			<0.0002	
Uranium (U	<0.0001						<0.0001						<0.0001			<0.0001			<0.0001	
Uranium (U Total													<0.0001			<0.0001			<0.0001	
Zinc (Zn)	<0.005						<0.005						0.002			0.003			0.007	
Zinc (Zn) Total													<0.005			<0.005			0.022	
Thallium (Tl)	<0.0001						<0.0001						<0.0001			<0.0001			<0.0001	
Thallium (Tl) Total													<0.0001			<0.0001			<0.0001	
CaCO3 (Acidity)	36	26			24	31	35	20	28	41	29	25	27	31	22	19	31	12	27	35
CaCO3 (Alkalinity)	9	12			8	9	8	9	8	9	9	10	11	10	11	9	8	8	8	8
Bicarbonate							8	9	8	9	9	10	11	10	11	9	8	8	8	8
Calcium							5.5	5	5.6	5.5	7.8	5.2	5	6.1	5.7	5.8	5.1	5.4	5.2	6.4
Carbonate																				
Ammonia (NH3-N)																				
Nitrogen Total (N)																				
Chloride (Cl)	95	101			96	102	103	103	105	104	104	139	107	107	124	100	99	100	101	97
NATA EC	457	469			467	479	479	484	500	493	489	601	483	495	559	486	469	458	486	490
O2																				
Phosphate as PO4-P																				
Phosphorus Total (P)																				
NATA pH	5.9	5.9			5.8	6	5.7	6	5.9	6.1	5.9	6.1	5.8	5.8	5.7	6	5.7	6.4	5.9	5.8
Potassium (K)							4.6	4.4	4.6	5.4	4.7	4.6	4.3	4.9	4.7	4.7	4.4	4.7	4.3	5.2
Sodium (Na)	44.2	50.8			54.2	51	52.6	48.9	53.4	53.8	56.7	57.1	51.9	65.1	62	58.7	52.7	53	52.9	54.1
Sulphate (SO_4^{2-})	27	28			26	25	27	28	28	28	28	33	28	27	33	29	28	27	28	28
TDS	270	270			200	230	230	240	240	260	270	270	240	270	280	250	260	280	220	270
Eh													459			412			494	
Radium 226	<0.01												<0.01			0.02			0.02	
Radium 228	<0.08												<0.08			<0.08			<0.08	
Acrylamide																				
Sulphate:Chloride Ratio	0.28	0.28	#DIV/0!	#DIV/0!	0.27	0.25	0.26	0.27	0.27	0.27	0.27	0.24	0.26	0.25	0.27	0.29	0.28	0.27	0.28	0.29
Chloride:Sulphate Ratio	3.52	3.61	#DIV/0!	#DIV/0!	3.69	4.08	3.81	3.68	3.75	3.71	3.71	4.21	3.82	3.96	3.76	3.45	3.54	3.70	3.61	3.46

YA_MB08S		Triggers	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Date				19/06/2019			21/10/2019	11/11/2019	12/12/2019	13/01/2020	12/02/2020	12/03/2020	9/04/2020	7/05/2020	9/06/2020	9/07/2020	10/08/2020	9/09/2020	13/10/2020	9/11/2020	8/12/2020
Casing Height above topo	m		0.00	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41
Depth of bore	m		9.83	9.83	9.83	9.83	9.83	9.83	9.83	9.83	9.83	9.83	9.83	9.83	9.83	9.83	9.83	9.83	9.83	9.83	9.83
SWL (m)	m (from top of casing)		1.68				1.35	1.54	1.8	1.89	2.01	2.11	2.14	1.95	1.86	1.26	0.56	0.55	1.1	0.97	1.5
m AHD			21.80				20.86	20.67	20.41	20.32	20.2	20.1	20.07	20.26	20.35	20.95	21.65	21.66	21.11	21.24	20.71
Purge	L		>500L				407	398	385	191	188	185	183	189	191	206	222	223	210	213	200
Field pH		<5	6.03				5.86	5.77	5.8	5.84	5.76	5.71	5.49	5.66	5.95	5.99	5.77	5.8	5.89	5.82	5.72
Temp	degrees C		18.4				17.4	18	20.4	21	22.2	21.7	21.8	20.4	17.4	15.4	15.5	15.5	17	17.2	18.8
Field Cond (EC)	uS/cm	>671.4	740.00				640.00	600.00	680.00	570.00	530.00	520.00	510.00	540.00	510.00	510.00	510.00	480.00	620.00	530.00	570.00
Field Salinity	ppm		350				320	300	340	280	260	260	260	270	260	260	260	240	310	260	280
Field ROP	mv						234	237	318	329	353	324	457	396	340	292	355	295	291	302	320
Field Alkalinity		<15.37					21	21	24	18	18	24	21	18	24	21	21	27	27	30	24
Field TTA		>56.45					40	40	45	50	55	50	56	60	50	45	45	40	40	45	45
Field DO %S							21.2	20.8	24.6	26.4	14.9	15.5	14.9	14.6	13.4	15.6	12	15.6	9.4	15.7	16.8
Comments			L9	No Access	No Access	No Access															
Aluminium Filtered (Al)	mg/L	>1	0.013				<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.014	0.006	<0.005	0.006	0.009	<0.005	<0.005	0.011	<0.005
Aluminium Total (Al)	mg/L		0.033												<0.005						
Arsenic (As)	mg/L		0.0001												0.0001						
Arsenic (As) Total	mg/L																				
Boron (B)	mg/L																				
Cadmium (Cd)	mg/L		<0.0001												<0.0001						
Cadmium (Cd) Total	mg/L																				
Chromium (Cr)	mg/L																				
Chromium VI (Cr)	mg/L																				
Chromium VI (Cr) Total	mg/L																				
Chromium Total (Cr)	mg/L		0.0002												<0.0001						
Cobalt (Co)	mg/L																				
Cobalt (Co) Total	mg/L																				
Copper (Cu)	mg/L																				
Copper (Cu) Total	mg/L																				
Iron Filtered (Fe)	mg/L	>0.47	0.58				0.36	0.37	0.32	0.28	0.25	0.26	0.49	0.43	0.3	0.26	0.27	0.09	0.1	0.12	0.079
Iron Total (Fe)	mg/L		0.82												0.42						
Lead (Pb)	mg/L																				
Manganese (Mn)	mg/L	>0.02	0.027				0.016	0.017	0.016	0.015	0.014	0.016	0.017	0.017	0.015	0.013	0.019	0.015	0.013	0.011	0.013
Magnesium (Mg)	mg/L						12.2	12.2	11.6	10.8	11	11.7	11.8	10.7		12.4	12.4	11.7	10.2	9.4	10.4
Mercury (Hg)	mg/L																				
Mercury (Hg) Total	mg/L																				
Molybdenum (Mo)	mg/L																				
Nickel (Ni)	mg/L		0.0008												0.0008						
Nickel (Ni) Total	mg/L																				
Selenium (Se)	mg/L		<0.0002												<0.0002						
Selenium (Se) Total	mg/L																				
Uranium (U)	mg/L																				
Uranium (U) Total	mg/L																				
Zinc (Zn)	mg/L		0.015												0.004						
Zinc (Zn) Total	mg/L																				
Thallium (Tl)	mg/L																				
Thallium (Tl) Total	mg/L																				
CaCO3 (Acidity)	mg/L		17				26	32	26	33	31	25	38	39	28	25	34	20	29	26	23
CaCO3 (Alkalinity)	mg/L		17				16	16	15	16	17	17	17	16	18	17	16	17	17	16	20
Bicarbonate	mg/L						16	16	15	16	17	17	17	16		17	16	17	17	16	20
Calcium	mg/L						2.5	2.7	2.5	2.2	2.2	2.4	2.5	2.3		2.7	2.8	2.6	2.2	2	2.5
Carbonate	mg/L																				
Ammonia (NH3-N)	mg/L		<0.010												<0.010						
Nitrogen Total (N)	mg/L		0.85												0.91						
Chloride (Cl)	mg/L	>130.28	138				123	121	122	119	118	117	119	118	117	114	118	106	103	100	105
NATA EC	uS/cm		557				513	510	511	494	493	482	499	485	494	483	502	468	454	443	468
O2	mg/L		4.8												4.8						
Phosphate as PO4-P	mg/L																				
Phosphorus Total (P)	mg/L		0.008												<0.005						
NATA pH			6.2				6.1	6.1	6.1	6.1	6.1	6.1	6	6	6.2	6.2	6.1	6.4	6.2	6.1	6.2
Potassium (K)	mg/L						2.9	3.4	3.2	2.9	3.1	3.6	3.5	3.4		3.4	3.6	3.1	2.8	2.6	2.8
Sodium (Na)	mg/L						69.6	73.5	67	62.4	62.1	67	67.1	67.4		68.8	67.3	66.5	59.6	55.3	59.4
Sulphate (SO_4^{2-})	mg/L	>39.22	36				35	34	35	35	36	36	36	36	36	37	37	36	40	39	38
Eh	mg/L																				
TDS	mg/L	>291.03	300				270	260	270	270	270	250	270	260	260	230	240	230	260	240	200
Radium 226	Bq/L																				
Radium 228	Bq/L																				
Acrylamide																					
Sulphate:Chloride Ratio		>0.5														0.32	0.31	0.34	0.39	0.39	0.36
Chloride:Sulphate Ratio		<2														3.08	3.19	2.94	2.58	2.56	2.76

YA_MB08S		Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23
Date		13/01/2021	8/02/2021	11/03/2021	14/04/2021	10/05/2021	8/06/2021	7/07/2021	11/08/2021	13/09/2021	12/10/2021	4/11/2021	13/12/2021	10/01/2022	10/02/2022	1/03/2022	6/04/2022	11/05/2022	15/06/2022	19/07/2022	10/08/2022	13/09/2022	18/10/2022	10/11/2022	1/12/2022	9/01/2023
Casing Height above topo	m	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41
Depth of bore	m	9.83	9.83	9.83	9.83	9.83	9.83	9.83	9.83	9.83	9.83	9.83	9.83	9.83	9.83	9.83	9.83	9.83	9.83	9.83	9.83	9.83	9.83	9.83	9.83	9.83
SWL (m)	m (from top of casing)	1.72	1.6	1.76	1.63	1.6	1.26	0.59	0.5	0.54	0.63	0.96	1.51	1.65	1.8	1.9	2.09	2.16	1.74	1.32	0.6	0.54	1.17	1.3	1.58	1.97
m AHD		20.49	20.61	20.45	20.58	20.61	20.95	21.62	21.71	21.67	21.58	21.25	20.70	20.56	20.41	20.31	20.12	20.05	20.47	20.89	21.61	21.67	21.04	20.91	20.63	20.24
Purge	L	195	198	193	197	198	206	221	224	223	221	213	200	196	192	190	184	184	190	200	220	240	207	200	180	160
Field pH		5.88	5.88	5.64	5.86	5.91	5.92	5.86	5.98	5.89	5.75	5.95	5.82	5.82	5.85	5.74	5.56	6.3	6	5.83	6.14	5.95	5.85	5.9	6.18	5.83
Temp	degrees C	19.2	21	22.1	21.5	20	17.4	16.7	15.6	17	17	17	17.6	19.2	22.2	21	22.6	20.2	18.4	17.1	17.9	15.1	17.6	18.9	17.7	21.7
Field Cond (EC)	uS/cm	520.00	540.00	530.00	530.00	540.00	520	550	510	510	550	620	660	680	670	660	690	680	510	600	560	510.00	490.00	500.00	550.00	530.00
Field Salinity	ppm	260	270	270	260	270	260	270	260	250	270	310	330	340	300	330	340	350	290	230	280	250	240	250	280	290
Field ROP	mv	348	369	372	470	380	370	398	323	296	355	362	159	328	410	182	358	306	333	269	305	287	291	280	330	319
Field Alkalinity		24	24	24	24	30	30	21	30	21	21	18	30	27	31	30	24	45	27	42	32	30	45	36	33	36
Field TTA		45	40	50	42	50	45	40	40	44	45	40	45	40	45	50	60	35	50	68	40	50	80	50	50	60
Field DO %S		16	13.4	17.7	14.8	18																				
Comments																										
Aluminium Filtered (Al)	mg/L	<0.005	<0.005	0.006	0.005	<0.005	<0.005	<0.005	<0.005	0.005	0.021	0.047	0.013	<0.005	0.009	0.018	0.006	0.02	<.005	0.01	0.009	<0.005	<0.005	0.009	0.009	<0.0005
Aluminium Total (Al)	mg/L													0.006					<.005						0.015	<0.005
Arsenic (As)	mg/L													<0.0001					<0.0001			<,0.0001				<0.0001
Arsenic (As) Total	mg/L																		0.0004			<0.0001			<0.0001	0.0002
Boron (B)	mg/L																									
Cadmium (Cd)	mg/L													<0.0001					<0.0001			<,0.0001				<0.0001
Cadmium (Cd) Total	mg/L																		<0.0001			<,0.0001			<0.0001	<0.0001
Chromium (Cr)	mg/L																		<0.0001			<,0.0001				<0.0001
Chromium VI (Cr)	mg/L													<0.004					<0.004			<0.004				<0.004
Chromium VI (Cr) Total	mg/L																		<0.001			<0.004			<0.004	<0.004
Chromium Total (Cr)	mg/L													<0.0001					0.0007			0.0004			<0.0001	<0.0001
Cobalt (Co)	mg/L													0.0001					0.0001			<,0.001				0.0007
Cobalt (Co) Total	mg/L																		0.0001			<0.0001			0.0001	0.0007
Copper (Cu)	mg/L													0.0034					<0.0001			0.0002				0.0008
Copper (Cu) Total	mg/L																		<0.0001			0.0003			0.0006	0.001
Iron Filtered (Fe)	mg/L	0.2	0.2	0.18	0.2	0.25	0.11	0.15	0.11	0.1	0.23	0.14	0.18	0.18	0.19	0.25	0.25	0.24	0.016	0.17	0.24	0.0003	0.072	0.084	0.1	0.16
Iron Total (Fe)	mg/L													0.26					0.086			0.11			0.15	0.16
Lead (Pb)	mg/L																		<0.0001			<,0.0001				<0.0001
Manganese (Mn)	mg/L	0.015	0.015	0.016	0.015	0.015	0.013	0.015	0.016	0.016	0.018	0.018	0.022	0.021	0.02	0.025	0.019	0.02	0.023	0.024	0.031	0.015	0.014	0.014	0.016	0.02
Magnesium (Mg)	mg/L	12.1	11.9	12.4	13.1	12.6							16.6	16.5	17.3	17.1	15.4	15.3	14.1	15.7	14.6	15.1	12.6	13.3	13.1	15.8
Mercury (Hg)	mg/L													<0.00005					<0.00005			<0.00005			<0.00005	<0.00005
Mercury (Hg) Total	mg/L																		<0.00005			<0.00005				<0.00005
Molybdenum (Mo)	mg/L																									
Nickel (Ni)	mg/L													<0.0005					<0.0005			<0.0005				0.0007
Nickel (Ni) Total	mg/L																		0.0006			<0.0005			<0.0005	0.0007
Selenium (Se)	mg/L													<0.0002					<0.0002			<0.0002				<0.0002
Selenium (Se) Total	mg/L																		<0.0002			<0.0002			<0.0002	<0.0002
Uranium (U)	mg/L													<0.0001					<0.0001			<0.0001				<0.0001
Uranium (U) Total	mg/L																		<0.0001			<0.0001			<0.0001	<0.0001
Zinc (Zn)	mg/L													<0.005					<0.001			<0.002				0.005
Zinc (Zn) Total	mg/L																		<0.005			<0.005			0.007	0.005
Thallium (Tl)	mg/L													<0.0001					<0.0001			<0.0001				<0.0001
Thallium (Tl) Total	mg/L																		<0.0001			<0.0001			<0.0001	<0.0001
CaCO3 (Acidity)	mg/L	24	30	34	36	27	35	22	26	22	30	31	48	21	25	37	29	36	34	24	29	28	29	32	13	35
CaCO3 (Alkalinity)	mg/L	20	19	18	17	17	18	17	17	16	15	15	15	17	15	15	16	15	15	15	15	15	15	14	15	15
Bicarbonate	mg/L	20	19	18	17	17							15	17	15	15	16	15	15	15	15	15	15	14	15	15
Calcium	mg/L	2.8	2.6	2.8	2.9	2.9							3.9	3.9		3.8		3.6	3.2	3.6	3.5	34	2.9	3.3	3.2	4
Carbonate	mg/L																									
Ammonia (NH3-N)	mg/L																									
Nitrogen Total (N)	mg/L																									
Chloride (Cl)	mg/L	111	110	113	110	109	111	111	102	107	123	130	143	149	148	140	134	128	122	115	115	109	108	112	111	131
NATA EC	uS/cm	478	478	474	478	478	464	470	464	483	525	536	574	601	593	583	564	532	510	492	491	473	462	474	459	544
O2	mg/L																									
Phosphate as PO4-P	mg/L																									
Phosphorus Total (P)	mg/L																									
NATA pH		6.2	6.1	6	6.1	6.1	6.1	6.4	7	6.4	6.3	6.2	6	6.1	6.1	6.2	6.4	6.1	6.2	6.3	6	6.1	6	6.6	6.7	6
Potassium (K)	mg/L	3.5	3.7	4	4	3.9							4.5	4.1	4.5	5.2	4.1	4.1	3.6	3.7	3.7	3.7	3.6	3.8	3.6	4.5
Sodium (Na)	mg/L	65.8	66.5	68.8	76.4	70.8	63.7	65.3	62.9	67.2	70.4	75.6	78.7	76.9	77.7	80.2	75.1	73.4	67.5	75.9	69	73.1	65.1	65.3	69.7	74.3
Sulphate (SO_4^{2-})	mg/L	38	37	36	37	37	37	37	38	37	37	36	36	38	37	36	37	37	36	37	37	36	38	37	37	37
Eh	mg/L																		512			349				270
TDS	mg/L	250	240	240	250	250	280	240	240	230	240	290	260	320	270	290	260	250	300		270	250	250	250	230	360
Radium 226	Bq/L													0.02					0.01			0.01			<0.01	
Radium 228	Bq/L													<0.08					<0.08			<0.08			<0.08	
Acrylamide																										
Sulphate:Chloride Ratio		0.34	0.34	0.32	0.34	0.34	0.33	0.33	0.37	0.35	0.30	0.28	0.25	0.26	0.25	0.26	0.28	0.29	0.30	0.32	0.32	0.33	0.35	0.33	0.33	0.28
Chloride:Sulphate Ratio		2.92	2.97	3.14	2.97	2.95	3.00	3.00	2.68	2.89	3.32	3.61	3.97	3.92	4.00	3.89	3.62	3.46	3.39	3.11	3.11	3.03	2.84	3.03	3.00	3.54

Installed December 2017-located inside Boardman's gate . Superficial aquifer only. Screens at 2-8m

YA_MB09S		Triggers	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17
Date														13/12/2017
Casing Height above topo	m	0.62		0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62
Depth of bore	m	8.27		8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27
SWL (m)	m (from top of casing)													2.96
m AHD														28.24
Purge	L													
Field pH		<5												
Temp	degrees C													
Field Cond (EC)	uS/cm	>3259.95												
Field Salinity	ppm													
Field ROP	mv													
Field Alkalinity		<32.72												
Field TTA		>114.71												
Field DO %S														
Comments														Dip Only
Aluminium Filtered (Al)	mg/L	>1												
Aluminium Total (Al)	mg/L													
Arsenic (As)	mg/L													
Arsenic (As) Total	mg/L													
Boron (B)	mg/L													
Cadmium (Cd)	mg/L													
Cadmium (Cd) Total	mg/L													
Calcium (Ca)	mg/L													
Chromium (Cr)	mg/L													
Chromium (Cr) Total	mg/L													
Chromium VI (Cr)	mg/L													
Chromium VI (Cr) Total	mg/L													
Cobolt (Co)	mg/L													
Cobolt (Co) Total	mg/L													
Copper (Cu)	mg/L													
Copper (Cu) Total	mg/L													
Iron Filtered (Fe)	mg/L	>1.62												
Iron Total (Fe)	mg/L													
Lead (Pb)	mg/L													
Manganese (Mn)	mg/L	>0.03												
Magnesium (Mg)	mg/L													
Mercury (Hg)	mg/L													
Mercury (Hg) Total	mg/L													
Molybdenum (Mo)	mg/L													
Nickel (Ni)	mg/L													
Nickel (Ni) Total	mg/L													
Selenium (Se)	mg/L													
Selenium (Se) Total	mg/L													
Uranium (U	mg/L													
Uranium (U Total	mg/L													
Zinc (Zn)	mg/L													
Zinc (Zn) Total	mg/L													
Thallium (Tl)	mg/L													
Thallium (Tl) Total	mg/L													
CaCO3 (Acidity)	mg/L													
CaCO3 (Alkalinity)	mg/L													
Bicarbonate	mg/L													
Calcium	mg/L													
Carbonate	mg/L													
Ammonia (NH3-N)	mg/L													
Nitrogen Total (N)	mg/L													
Chloride (Cl)	mg/L	>858.47												
NATA EC	uS/cm													
O2	mg/L													
Phosphate as PO4-P	mg/L													
Phosphorus Total (P)	mg/L													
NATA pH														
Potassium (K)	mg/L													
Sodium (Na)	mg/L													
Sulphate (SO_4^{2-})	mg/L	>190.83												
TDS	mg/L	>1638.33												
Eh	mV													
Radium 226														
Radium 228														
Acrylamide														
Sulphate:Chloride Ratio		>0.5												
Chloride:Sulphate Ratio		<1.34												

YA_MB09S	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
Date	11/01/2018	12/02/2018	12/03/2018	12/04/2018	8/05/2018	12/06/2018	10/07/2018	8/08/2018	10/09/2018	10/10/2018	7/11/2018	6/12/2018
Casing Height above topo	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62
Depth of bore	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27
SWL (m)	3.32	3.57	3.75	3.87	3.82	3.41	2.22	1.47		1.71	2.07	2.42
m AHD	27.88	27.63	27.45	27.33	27.38	27.79	28.98	29.73		29.49	29.13	28.78
Purge	59	56	54	53	53	58	73	82		79	74	69
Field pH	5.99	5.89	5.87	5.71	5.75	5.82	5.78	5.79		5.76	5.56	5.55
Temp	17.9	18.3	19.1	18.8	16.6	16.7	15.2	17.2		17.5	16.5	17.1
Field Cond (EC)	1020.00	870.00	800.00	790.00	770.00	1120.00	1360.00	1690.00		2030.00	2060.00	2590.00
Field Salinity	510	430	400	390	390	560	680	850		1010	1030	1290
Field ROP	193	203	223	231	88	235	355	419		322	363	236
Field Alkalinity	Too Murky	45	57	36	39	36	30	45		51	48	60
Field TTA	Too Murky	80	71	85	70	65	47	85		120	95	100
Field DO %S	16.3	9.2	8.7		8.4	10.4	10.6	12.3		12.6	14.2	18.4
Comments												
Aluminium Filtered (Al)	0.005	<0.005	<0.005	0.012	0.029	0.14	0.025	0.024		0.01	0.062	0.1
Aluminium Total (Al)	19		42			0.76						
Arsenic (As)	0.0001		0.0002			0.0005						
Arsenic (As) Total												
Boron (B)												
Cadmium (Cd)	<0.0001		<0.0001			<0.0001						
Cadmium (Cd) Total												
Calcium (Ca)												
Chromium (Cr)	<0.0001		<0.0001			<0.0001						
Chromium (Cr) Total												
Chromium VI (Cr)												
Chromium VI (Cr) Total												
Cobolt (Co)												
Cobolt (Co) Total												
Copper (Cu)												
Copper (Cu) Total												
Iron Filtered (Fe)	0.49	0.11	0.45	0.42	0.39	0.6	0.047	0.081		0.041	0.029	0.14
Iron Total (Fe)	10		8			0.21						
Lead (Pb)												
Manganese (Mn)	0.059	0.012	0.016	0.011	0.01	0.015	0.007	0.01		0.006	0.006	0.009
Magnesium (Mg)		25.7		15.4	17.7		42.9	61.2		72.2	97.3	122
Mercury (Hg)												
Mercury (Hg) Total												
Molybdenum (Mo)												
Nickel (Ni)	0.001		0.0005			<0.0005						
Nickel (Ni) Total												
Selenium (Se)	0.0003		0.0005			0.0005						
Selenium (Se) Total												
Uranium (U												
Uranium (U Total												
Zinc (Zn)	0.003		0.002			0.003						
Zinc (Zn) Total												
Thallium (Tl)												
Thallium (Tl) Total												
CaCO3 (Acidity)	55	34	41	41	34	39	38	40		44	67	80
CaCO3 (Alkalinity)	44	33	32	32	30	37	34	43		51	53	55
Bicarbonate		33		32	30		34	43		51	53	55
Calcium		2.5		1.3	1.4		3.9	6.1		8.9	11.3	12.3
Carbonate												
Ammonia (NH3-N)	16		13			10						
Nitrogen Total (N)	0.22		<0.010			<0.010						
Chloride (Cl)	170	150	130	140	150	220	260	370		457	445	611
NATA EC	826	816	727	700	710	1010	1110	1530		1890	2040	2480
O2	3.9		5.2			4.6						
Phosphate as PO4-P												
Phosphorus Total (P)	0.29		0.12			0.058						
NATA pH	6.3	6.2	6.1	6.1	6.1	6.1	6.1	6.3		6.4	6.1	6
Potassium (K)		1.6		1.3	1.5		2.4	3		4.7	4	2.2
Sodium (Na)		111		85.3	87.2		142	192		194	269	311
Sulphate (SO_4^{2-})	98	85	61	56	57	77	89	120		190	190	210
TDS	490	444	378	348	377	528	627	822		1100	1100	1500
Eh												
Radium 226												
Radium 228												
Acrylamide												
Sulphate:Chloride Ratio	0.58	0.57	0.47	0.40	0.38	0.35	0.34	0.32	#DIV/0!	0.42	0.43	0.34
Chloride:Sulphate Ratio	1.73	1.76	2.13	2.50	2.63	2.86	2.92	3.08	#DIV/0!	2.41	2.34	2.91

YA_MB09S	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
Date	9/01/2019	7/02/2019	12/03/2019	9/04/2019	7/05/2019	10/06/2019	9/07/2019	12/08/2019	10/09/2019	8/10/2019	7/11/2019	10/12/2019
Casing Height above topo	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62
Depth of bore	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27
SWL (m)	2.95	3.31	3.56	3.69	3.75	3.78	2.76	2.44		2.45	2.77	3.28
m AHD	28.25	27.89	27.64	27.51	27.45	27.42	28.44	28.76		28.75	28.43	27.92
Purge	64	60	57	55	54	54	66	70		70	66	60
Field pH	5.5	5.69	5.77	5.83	5.8	5.9	5.92	5.89		5.84	5.86	5.81
Temp	18.9	18.7	17.8	17.6	17	16.8	16.5	16.5		17.1	18.8	18.6
Field Cond (EC)	3130.00	2530.00	2080.00	1790.00	1670.00	1630.00	1420.00	2140.00		3610.00	4310.00	3300.00
Field Salinity	1590	1260	1040	900	840	810	710	1070		1810	2160	1150
Field ROP	369	295	312	323	341	351	310	331		299	302	358
Field Alkalinity	60	69	60	45	57	57	42	42		45	57	57
Field TTA	100	120	100	90	95	80	50	80		80	100	100
Field DO %S	17.5	16.2	17.6	16.7	18.5	15.6	15.6	17.4		18.8	19.8	20.2
Comments												
Aluminium Filtered (Al)	0.019	0.043	0.082	0.012	<0.005	0.033	0.025	<0.005		0.03	0.019	0.007
Aluminium Total (Al)						9.3						
Arsenic (As)						0.0004						
Arsenic (As) Total												
Boron (B)												
Cadmium (Cd)						<0.0001						
Cadmium (Cd) Total												
Calcium (Ca)												
Chromium (Cr)						<0.0001						
Chromium (Cr) Total												
Chromium VI (Cr)												
Chromium VI (Cr) Total												
Cobolt (Co)												
Cobolt (Co) Total												
Copper (Cu)												
Copper (Cu) Total												
Iron Filtered (Fe)	0.014	0.018	0.052	0.029	0.044	0.008	0.09	0.032		0.086	0.23	0.12
Iron Total (Fe)						1						
Lead (Pb)												
Manganese (Mn)	0.007	0.007	0.018	0.005	0.008	0.007	0.01	0.008		0.012	0.01	0.007
Magnesium (Mg)	148	91.8	73.4	45.8	58.6		46.9	62.1		130	141	73.9
Mercury (Hg)												
Mercury (Hg) Total												
Molybdenum (Mo)												
Nickel (Ni)						<0.0005						
Nickel (Ni) Total												
Selenium (Se)						0.0005						
Selenium (Se) Total												
Uranium (U												
Uranium (U Total												
Zinc (Zn)						0.011						
Zinc (Zn) Total												
Thallium (Tl)												
Thallium (Tl) Total												
CaCO3 (Acidity)	72	54	29	57	34	58	41	54		110	84	58
CaCO3 (Alkalinity)	60	50	42	40	39	39	37	40		48	52	44
Bicarbonate	60	50	42	40	39		37	40		48	52	44
Calcium	15.3	10.6	8.2	5	6.2		3.8	5.5		11.7	13.8	7.7
Carbonate												
Ammonia (NH3-N)						3.4						
Nitrogen Total (N)						<0.010						
Chloride (Cl)	708	556	469	380	418	401	323	523		1040	1240	826
NATA EC	3000	2270	1830	1540	1630	1550	1350	2010		3430	4100	2800
O2						5.4						
Phosphate as PO4-P												
Phosphorus Total (P)						0.027						
NATA pH	6.2	6.3	6.5	6.1	6.4	6.2	6.4	6.2		6.2	6.1	6.2
Potassium (K)	2.9	4.2	3.2	2	2.1		2.6	2.6		3.6	3.3	2
Sodium (Na)	364	288	242	169	227		180	230		514	584	345
Sulphate (SO_4^{2-})	230	190	140	100	98	92	84	110		170	190	120
TDS	1700	1100	1100	880	900	830	700	1100		1700	2200	1400
Eh												
Radium 226												
Radium 228												
Acrylamide												
Sulphate:Chloride Ratio	0.32	0.34	0.30	0.26	0.23	0.23	0.26	0.21	#DIV/0!	0.16	0.15	0.15
Chloride:Sulphate Ratio	3.08	2.93	3.35	3.80	4.27	4.36	3.85	4.75	#DIV/0!	6.12	6.53	6.88

YA_MB09S	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Date	9/01/2020	10/02/2020	9/03/2020	8/04/2020	7/05/2020	8/06/2020	8/07/2020	6/08/2020	7/09/2020	12/10/2020	5/11/2020	7/12/2020
Casing Height above topo	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62
Depth of bore	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27
SWL (m)	3.61	3.86	3.99	4.06	4.22	3.92	3.73	2.74	2.42	2.52	2.77	2.92
m AHD	27.59	27.34	27.21	27.14	26.98	27.28	27.47	28.46	28.78	28.68	28.43	28.28
Purge	28	26	26	25	24	26	27	33	35	35	33	32
Field pH	5.84	5.9	5.86	5.65	5.95	5.62	5.96	5.85	5.9	5.82	5.86	5.88
Temp	18.7	19.5	20	20.3	18.5	19.1	16.9	16.2	16.5	18	17.7	18.2
Field Cond (EC)	1470.00	1570.00	1640.00	1690.00	1810.00	1810.00	1980.00	1680.00	1590.00	2470.00	1790.00	1470.00
Field Salinity	740	780	820	840	900	910	990	840	790	1240	890	740
Field ROP	364	384	412	467	471	406	376	368	382	392	437	408
Field Alkalinity	45	45	48	51	48	48	45	51	51	57	60	57
Field TTA	80	75	80	90	85.000	75	85	75	80	95	100	80
Field DO %S	24.3	15.7	15.3	14.2	13.7	12.6	15.6	16.1	15.4	14	20.6	17.7
Comments												
Aluminium Filtered (Al)	0.02	0.079	0.044	<0.005	0.016	0.038	0.036	0.016	0.078	0.048	0.01	0.015
Aluminium Total (Al)						15						
Arsenic (As)						0.0006						
Arsenic (As) Total												
Boron (B)												
Cadmium (Cd)						<0.0001						
Cadmium (Cd) Total												
Calcium (Ca)												
Chromium (Cr)						0.0001						
Chromium (Cr) Total												
Chromium VI (Cr)												
Chromium VI (Cr) Total												
Cobolt (Co)												
Cobolt (Co) Total												
Copper (Cu)												
Copper (Cu) Total												
Iron Filtered (Fe)	0.1	0.064	0.045	<0.005	0.012	0.15	0.069	0.045	0.4	2.5	0.081	0.14
Iron Total (Fe)						1.1						
Lead (Pb)												
Manganese (Mn)	0.007	0.008	0.008	0.009	0.009	0.012	0.009	0.012	0.015	0.016	0.009	0.01
Magnesium (Mg)	41	45.2	47.3	53.6	54.4		67.2	54.3	45.3	74.4	42.8	36.5
Mercury (Hg)												
Mercury (Hg) Total												
Molybdenum (Mo)												
Nickel (Ni)						<0.0005						
Nickel (Ni) Total												
Selenium (Se)						0.0005						
Selenium (Se) Total												
Uranium (U												
Uranium (U Total												
Zinc (Zn)						0.004						
Zinc (Zn) Total												
Thallium (Tl)												
Thallium (Tl) Total												
CaCO3 (Acidity)	56	58	61	61	57	50	58	48	53	63	54	54
CaCO3 (Alkalinity)	39	38	39	41	37	40	41	36	38	53	51	43
Bicarbonate	39	38	39	41	37		41	36	38	53	51	43
Calcium	3.5	3.8	3.9	4.4	4.4		5.2	4.3	4.1	5.9	3.6	3.1
Carbonate												
Ammonia (NH3-N)												
Nitrogen Total (N)						<0.010						
Chloride (Cl)	356	396	428	465	514	491	532	458	420	697	469	368
NATA EC	1380	1440	1590	1680	1770	1810	1950	1630	1530	2410	1750	1450
O2						4.7						
Phosphate as PO4-P												
Phosphorus Total (P)						0.094						
NATA pH	6.2	6.1	6.1	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.3	6.2
Potassium (K)	2	2.4	2.5	2.4	2.7		2.9	2.9	2.6	3.3	2.6	2
Sodium (Na)	189	197	213	227	235		278	240	212	349	257	191
Sulphate (SO_4^{2-})	92	97	100	100	110	110	110	110	100	120	100	110
TDS	790	840	1000	930	1100	990	1100	840	840	1300	930	680
Eh												
Radium 226												
Radium 228												
Acrylamide												
Sulphate:Chloride Ratio	0.26	0.24	0.23	0.22	0.21	0.22	0.21	0.24	0.24	0.17	0.21	0.30
Chloride:Sulphate Ratio	3.87	4.08	4.28	4.65	4.67	4.46	4.84	4.16	4.20	5.81	4.69	3.35

YA_MB09S	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
Date	12/01/2021	4/02/2021	10/03/2021	14/04/2021	6/05/2021	3/06/2021	6/07/2021	9/08/2021	13/09/2021	14/10/2021	10/11/2021	14/12/2021
Casing Height above topo	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62
Depth of bore	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27
SWL (m)	3.38	3.64	3.66	3.79	3.62	3.51	2.92			1.93	2.12	2.55
m AHD	27.82	27.56	27.54	27.41	27.58	27.69	28.28			29.27	29.08	28.65
Purge	29	28	28	27	28	29	32			38	37	34
Field pH	5.72	5.56	5.81	5.83	5.76	5.88	5.94			6.1	6	6.02
Temp	18.6	18.7	20.4	18.9	19.2	17.8	18.1			17.5	17.8	18.5
Field Cond (EC)	1500.00	1490.00	1570.00	1640.00	1900.00	1820.00	1900.00			2910.00	2890.00	1410.00
Field Salinity	750	750	790	820	950	910	950			1460	1450	705
Field ROP	402	441	435	512	431	425	432			377	364	
Field Alkalinity	54	48	69	45	66	48	48			60	57	99
Field TTA	75.000	50	76	89	100	85	75			100	95	86
Field DO %S	17.1	14.8	18.3	18.5	18.5							
Comments								no access	no access			
Aluminium Filtered (Al)	0.009	0.042	0.14	0.029	0.011	0.009	0.019			0.019	0.021	0.017
Aluminium Total (Al)												
Arsenic (As)												
Arsenic (As) Total												
Boron (B)												
Cadmium (Cd)												
Cadmium (Cd) Total												
Calcium (Ca)												
Chromium (Cr)												
Chromium (Cr) Total												
Chromium VI (Cr)												
Chromium VI (Cr) Total												
Cobolt (Co)												
Cobolt (Co) Total												
Copper (Cu)												
Copper (Cu) Total												
Iron Filtered (Fe)	0.110	0.052	0.076	0.25	0.17	0.37	0.6			4.4	2.7	6
Iron Total (Fe)												
Lead (Pb)												
Manganese (Mn)	0.010	0.012	0.014	0.013	0.014	0.011	0.017			0.015	0.016	0.16
Magnesium (Mg)	33.9	43.4	44	47.3	48.3							126
Mercury (Hg)												
Mercury (Hg) Total												
Molybdenum (Mo)												
Nickel (Ni)												
Nickel (Ni) Total												
Selenium (Se)												
Selenium (Se) Total												
Uranium (U												
Uranium (U Total												
Zinc (Zn)												
Zinc (Zn) Total												
Thallium (Tl)												
Thallium (Tl) Total												
CaCO3 (Acidity)	51	42	67	65	63	58	41			64	83	70
CaCO3 (Alkalinity)	39	67	45	37	40	39	38			61	57	83
Bicarbonate	39	67	45	37	40							83
Calcium	2.6	3.7	3.7	4.3	4.3							13.1
Carbonate												
Ammonia (NH3-N)												
Nitrogen Total (N)												
Chloride (Cl)	390	420	405	431	505	485	502			788	771	1150
NATA EC	1500	1700	1500	1600	1820	1740	1750			2750	2840	3890
O2												
Phosphate as PO4-P												
Phosphorus Total (P)												
NATA pH	6.2	6.2	6	6.1	6.1	6.2	6.2			6.2	6.1	6.2
Potassium (K)	1.9	2.9	3	3.5	3							4.8
Sodium (Na)	178	223	243	252	255	240	270			448	412	615
Sulphate (SO_4^{2-})	98	96	96	99	100	100	100			140	52	180
TDS	730	770	840	910	910	970	1000			1400	840	1900
Eh												
Radium 226												
Radium 228												
Acrylamide												
Sulphate:Chloride Ratio	0.25	0.23	0.24	0.23	0.20	0.21	0.20	#DIV/0!	#DIV/0!	0.18	0.07	0.16
Chloride:Sulphate Ratio	3.98	4.38	4.22	4.35	5.05	4.85	5.02	#DIV/0!	#DIV/0!	5.63	14.83	6.39

YA_MB09S	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23
Date	11/01/2022	10/02/2022	9/03/2022	6/04/2022	12/05/2022	16/06/2022	5/07/2022	9/08/2022	8/09/2022	20/10/2022	9/11/2022	30/11/2022	11/01/2023
Casing Height above topo	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62
Depth of bore	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27
SWL (m)	2.99	3.36	3.63	3.76	3.8	3.76	3.29	2.2	1.98	2.28	2.5	2.78	3.35
m AHD	28.21	27.84	27.57	27.44	27.40	27.44	27.91	29.00	29.22	28.92	28.70	28.42	27.85
Purge	32	30	28	27	27	28	29	36	42	40	38	35	40
Field pH	6.05	5.87	5.91	5.85	5.93	6.2	5.94	5.9	6.01	5.76	5.85	5.95	6.09
Temp	19	17.9	20.3	17.9	18.7	17	17.5	17.1	16.5	17.7	18.3	19.9	18.8
Field Cond (EC)	1680.00	2300.00	2380.00	2250.00	1880.00	2400.00	2860.00	1880.00	3100.00	3700.00	4050.00	4730.00	2990.00
Field Salinity	840	1100	1190	1140	960	1200	1460	635	1550	1800	2020	2370	1490
Field ROP	399	421	359	364	360	363	289	377	345	290	290	290	215
Field Alkalinity	75	45	60	40	33	45	51	45	36	90	75	84	75
Field TTA	110	105	120	100	80	20	70	90	120	140	110	140	140
Field DO %S													
Comments													
Aluminium Filtered (Al)	0.008	0.035	0.034	0.03	0.019	0.029	0.024	0.046	0.017	0.035	0.047	0.04	0.047
Aluminium Total (Al)						0.55			0.19				2.1
Arsenic (As)						0.0008			0.0013				0.001
Arsenic (As) Total						0.0008			0.0013				0.0013
Boron (B)													
Cadmium (Cd)						<0.0001			<0.0001				<0.0001
Cadmium (Cd) Total						<0.0001			<0.0001				<0.0001
Calcium (Ca)									8.5				9.3
Chromium (Cr)						0.0001			0.0001				0.0002
Chromium (Cr) Total						0.0005			0.001				0.0033
Chromium VI (Cr)						<0.004			<0.004				<0.004
Chromium VI (Cr) Total						<0.004			<0.004				<0.004
Cobolt (Co)						0.0001			0.0002				0.0004
Cobolt (Co) Total						0.0001			0.0002				0.0007
Copper (Cu)						0.0005			<0.0001				0.0008
Copper (Cu) Total						0.0006			0.0002				0.0013
Iron Filtered (Fe)	3.7	0.25	0.11	0.15	0.42	0.99	0.93	0.49	4.3	8	6.6	5.6	4
Iron Total (Fe)						0.99			7.8				4.5
Lead (Pb)						0.0002			<0.0001				0.0003
Manganese (Mn)	0.013	0.016	0.023	0.024	0.027	0.022	0.032	0.033	0.025	0.023	0.02	0.02	0.024
Magnesium (Mg)	77.6	56.5	55.3	53	58.8	76.9	97.7	79.5	109	115	126	151	90.8
Mercury (Hg)						<0.00005			<0.00005				<0.00005
Mercury (Hg) Total						<0.00005			<0.00005				<0.00005
Molybdenum (Mo)													
Nickel (Ni)						<0.0005			<0.0005				0.0009
Nickel (Ni) Total						<0.0005			<0.0005				0.0016
Selenium (Se)						<0.0002			<0.0002				<0.0002
Selenium (Se) Total						<0.0002			<0.0002				0.0003
Uranium (U						0.0007			0.0002				<0.0001
Uranium (U Total						0.0008			0.0003				0.0006
Zinc (Zn)						0.007			0.002				0.013
Zinc (Zn) Total						0.007			<0.005				0.008
Thallium (Tl)						<0.0001			<0.0001				<0.0001
Thallium (Tl) Total						<0.0001			<0.0001				<0.0001
CaCO3 (Acidity)	58	45	53	69	35	56	65	38	84	97	98	71	78
CaCO3 (Alkalinity)	64	47	45	42	43	40	46	42	60	63	67	80	58
Bicarbonate	64	47	45	42	43	40	46	42	60	63	67	80	58
Calcium	8.2	5.5	4.9	4.8	5.2	6.3	8	7	8.5	10.4	12	14.2	9.3
Carbonate													
Ammonia (NH3-N)													
Nitrogen Total (N)													
Chloride (Cl)	839	555	536	553	591	684	771	706	910	1100	1240	1450	788
NATA EC	3020	2110	2050	2020	2140	2430	2620	2480	3130	3400	3960	4760	3110
O2													
Phosphate as PO4-P													
Phosphorus Total (P)													
NATA pH	6.2	6.2	6.3	6.5	6.4	6.3	6.1	6.2	6.1	6.2	6.7	6.7	6.4
Potassium (K)	3.7	3.3	3.2	2.9	3.5	3.3	4	4.1	4.6	4.1	4.1	4.5	3.7
Sodium (Na)	433	314	316	297	331	394	460	393	513	609	608	817	502
Sulphate (SO_4^{2-})	150	120	120	110	120	130	120	120	130	160	160	180	150
TDS	1600	1000	1000	1000	1100	1200	1300	1300	1700	2100	2100	2300	1600
Eh						309			254				280
Radium 226						0.02			0.02				0.01
Radium 228						<0.08			<0.08				<0.08
Acrylamide													
Sulphate:Chloride Ratio	0.18	0.22	0.22	0.20	0.20	0.19	0.16	0.17	0.14	0.15	0.13	0.12	0.19
Chloride:Sulphate Ratio	5.59	4.63	4.47	5.03	4.93	5.26	6.43	5.88	7.00	6.88	7.75	8.06	5.25

Installed December 2017-located inside unmade road reserve (Boardman's paddock) . Superficial aquifer only. Screens at 1-7m

YA_MB010S		Triggers	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18
Date														########	11/01/2018	12/02/2018	12/03/2018	12/04/2018	8/05/2018	12/06/2018	10/07/2018	8/08/2018
Casing Height above topo	m	0.75		0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Depth of bore	m	7.00		7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40
SWL (m)	m (from top of casing)													2.28	2.4	2.43	2.49	2.54	2.57	1.24	0.89	0.79
m AHD														26.98	26.86	26.83	26.77	26.72	26.69	28.02	28.37	28.47
Purge	L														36	36	35	34	34	50	54	56
Field pH		<5													5.88	5.86	5.65	5.71	5.71	5.81	5.68	5.73
Temp	degrees C														20.9	21.4	21	21.2	16.7	15.2	13.7	15.9
Field Cond (EC)	uS/cm	>1932.48													1240.00	1380.00	1520.00	1590.00	1560.00	1620.00	1660.00	1750.00
Field Salinity	ppm														620	690	760	790	580	810	830	870
Field ROP	mv														199	233	312	281	297	265	278	412
Field Alkalinity		<23.27													Too Murky	Too Murky	54	42	33	33	30	42
Field TTA		>99.68													Too Murky	85	82	80	80	60	55	60
Field DO %S															9.8	10.1	14.6		11.1	16.6	15.6	15.2
Comments														Dip Only								
Aluminium Filtered (Al)	mg/L	>1													<0.005	<0.005	<0.005	0.033	0.025	0.072	0.02	0.012
Aluminium Total (Al)	mg/L														16		290			19		
Arsenic (As)	mg/L														<0.0001		0.0001			<0.0001		
Arsenic (As) Total	mg/L																					
Boron (B)	mg/L																					
Cadmium (Cd)	mg/L														<0.0001		<0.0001			<0.0001		
Cadmium (Cd) Total	mg/L																					
Calcium (Ca)	mg/L																					
Chromium VI (Cr)	mg/L																					
Chromium VI (Cr) Total	mg/L																					
Chromium (Cr)	mg/L																					
Chromium Total (Cr)	mg/L														<0.0001		<0.0001			<0.0001		
Cobolt (Co)	mg/L																					
Cobolt (Co) Total	mg/L																					
Copper (Cu)	mg/L																					
Copper (Cu) Total	mg/L																					
Iron Filtered (Fe)	mg/L	>4.62													1.1	1.2	3.7	1.5	2.2	0.83	0.64	0.76
Iron Total (Fe)	mg/L														5.8		41			4.1		
Lead (Pb)	mg/L																					
Manganese (Mn)	mg/L	>0.03													0.023	0.019	0.034	0.02	0.019	0.005	0.002	0.003
Magnesium (Mg)	mg/L															31.7		33.6	38.8		41.3	44.3
Mercury (Hg)	mg/L																					
Mercury (Hg) Total	mg/L																					
Molybdenum (Mo)	mg/L																					
Nickel (Ni)	mg/L														0.0006		0.0013			0.0006		
Nickel (Ni) Total	mg/L																					
Selenium (Se)	mg/L														<0.0002		<0.0002			<0.0002		
Selenium (Se) Total	mg/L																					
Uranium (U	mg/L																					
Uranium (U Total	mg/L																					
Zinc (Zn)	mg/L														0.003		0.003			0.002		
Zinc (Zn) Total	mg/L																					
Thallium (Tl)	mg/L																					
Thallium (Tl) Total	mg/L																					
CaCO3 (Acidity)	mg/L														37	29	52	60	47	35	33	28
CaCO3 (Alkalinity)	mg/L														31	23	28	30	28	27	25	27
Bicarbonate	mg/L															23		30	28		25	27
Calcium	mg/L															29.3		12.8	12.5		32.4	32
Carbonate	mg/L																					
Ammonia (NH3-N)	mg/L														0.13		0.2			0.066		
Nitrogen Total (N)	mg/L														3.7		3.3			1.4		
Chloride (Cl)	mg/L	>598.76													200	280	340	380	380	380	370	420
NATA EC	uS/cm														937	1190	1450	1480	1470	1520	1400	1560
O2	mg/L														4.4		5.9			4.7		
Phosphate as PO4-P	mg/L																					
Phosphorus Total (P)	mg/L														0.11		0.072			0.018		
NATA pH															6.3	6.1	6	5.9	6	6	6	6.2
Potassium (K)	mg/L															0.5		0.8	1.1		0.7	0.7
Sodium (Na)	mg/L															157		176	184		172	195
Sulphate (SO_4^{2-})	mg/L	159.93													130	130	110	100	100	130	120	130
TDS	mg/L	>1034.23													542	634	777	712	709	806	805	832
Radium 226																						
Radium 228																						
Acrylamide																						
Eh	mV																					
Sulphate:Chloride Ratio		>0.5													0.65	0.46	0.32	0.26	0.26	0.34	0.32	0.31
Chloride:Sulphate Ratio		<1.22													1.54	2.15	3.09	3.80	3.80	2.92	3.08	3.23

YA_MB010S	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Date	10/09/2018	10/10/2018	7/11/2018	6/12/2018	9/01/2019	7/02/2019	12/03/2019	9/04/2019	7/05/2019	10/06/2019	9/07/2019	12/08/2019	10/09/2019	8/10/2019	7/11/2019	10/12/2019	9/01/2020	10/02/2020	9/03/2020	8/04/2020	7/05/2020	8/06/2020	8/07/2020	6/08/2020	7/09/2020	12/10/2020	5/11/2020	7/12/2020
Casing Height above topo	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Depth of bore	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40
SWL (m)		1.66	1.9	2.15	2.26	2.37	2.43	2.52	2.56	2.36	1.26	1.63		1.81	2.15	2.4	2.47	2.53	2.58	2.18	1.98	2.36	1.81	1.5	1.12	1.71	1.98	2.05
m AHD		27.60	27.36	27.11	27.00	26.89	26.83	26.74	26.70	26.90	28.00	27.63		27.45	27.11	26.86	26.79	26.73	26.68	27.08	27.28	26.90	27.45	27.76	28.14	27.55	27.28	27.21
Purge		45	42	39	38	36	36	35	34	36	50	45		43	39	36	18	17	17	19	21	18	22	23	26	22	21	20
Field pH		5.75	5.6	5.8	5.6	5.77	5.86	5.83	5.9	5.94	5.94	5.94		5.92	6.03	5.92	5.89	6.01	5.95	5.75	5.89	5.71	6.06	5.98	5.93	5.69	5.93	6
Temp		16.8	17.9	18.2	20.2	19	18.9	19.6	20.3	19	15.1	15.5		18.1	18.5	19.5	20.1	21.9	23.4	22.3	19.3	18.5	16	15.1	16	17	18.2	17.8
Field Cond (EC)		1510.00	1750.00	1700.00	1660.00	1740.00	1810.00	1910.00	1660.00	1800.00	1700.00	1730.00		1680.00	1610.00	1870.00	1600.00	1630.00	1640.00	1630.00	1710.00	1440.00	1140.00	1400.00	1510.00	1680.00	1690.00	1540.00
Field Salinity		760	880	850	830	870	900	960	830	900	850	860		840	810	930	800	820	820	820	850	720	570	700	750	840	850	770
Field ROP		313	347	246	339	293	247	317	328	335	304	334		281	270	341	362	382	403	459	409	384	365	367	377	365	422	396
Field Alkalinity		27	39	39	33	33	45	39	45	39	45	42		33	33	36	45	45	48	54	54	33	30	42	48	45	33	39
Field TTA		55	65	70	85	110	100	75	85	75	45	55		55	40	55	70	75	70	85	93.000	35	45	55	45	75	55	48
Field DO %S		12.8	16.1	16.9	16.1	13.8	16.4	18.6	15.5	16.6	19.2	20.7		21.5	21.9	22.8	25.2	20.6	16.6	15.3	14.8	22.5	22.3	21.8	17	16.6	23.1	18.7
Comments																												
Aluminium Filtered (Al)		0.011	0.056	0.088	0.005	0.13	0.019	0.006	<0.005	0.03	0.015			0.006	<0.005	0.027	0.14	0.072	0.056	0.006	0.027	<0.005	0.009	0.054	0.016	0.015	<0.005	<0.005
Aluminium Total (Al)										13												0.66						
Arsenic (As)										<0.0001		0.006										<0.0001						
Arsenic (As) Total																												
Boron (B)																												
Cadmium (Cd)										<0.0001												<0.0001						
Cadmium (Cd) Total																												
Calcium (Ca)																												
Chromium VI (Cr)																												
Chromium VI (Cr) Total																												
Chromium (Cr)																												
Chromium Total (Cr)										<0.0001												0.0001						
Cobolt (Co)																												
Cobolt (Co) Total																												
Copper (Cu)																												
Copper (Cu) Total																												
Iron Filtered (Fe)		0.44	0.63	2.1	3.4	4.3	3.5	3.7	1.4	2	1.8	1.2		0.91	0.45	1.8	2	6.6	6.8	5.4	4.800	0.28	0.92	0.99	1.6	1.1	0.7	0.55
Iron Total (Fe)										7.5												1.7						
Lead (Pb)																												
Manganese (Mn)		0.002	0.002	0.009	0.008	0.007	0.007	0.007	0.012	0.007	0.002	0.002		0.002	<0.001	0.004	0.004	0.006	0.007	0.005	0.005	0.002	<0.001	0.017	0.026	0.022	0.003	0.002
Magnesium (Mg)		37.4	43	50.8	48.7	50.2	49.9	51.9	46.6		50.9	50.7		44	46.9	45.1	45.3	49.4	50	48.3	47		33.7	42	46.6	53.1	54.8	45.5
Mercury (Hg)																												
Mercury (Hg) Total																												
Molybdenum (Mo)																												
Nickel (Ni)										0.0009												<0.0005						
Nickel (Ni) Total																												
Selenium (Se)										<0.0002												<0.0002						
Selenium (Se) Total																												
Uranium (U																												
Uranium (U Total																												
Zinc (Zn)										0.017												0.003						
Zinc (Zn) Total																												
Thallium (Tl)																												
Thallium (Tl) Total																												
CaCO3 (Acidity)		21	38	52	39	40	24	58	29	52	34	38		21	27	40	56	60	61	56	55	18	30	36	40	40	29	28
CaCO3 (Alkalinity)		24	29	32	33	29	30	34	31	33	28	28		25	24	30	30	37	32	30	31	19	24	33	32	27	25	28
Bicarbonate		24	29	32	33	29	30	34	31		28	28		25	24	30	30	37	32	30	31		24	33	32	27	25	28
Calcium		35.3	40.2	16.6	13.8	14.8	13.7	14.7	13		31	37.3		47.8	58.2	23	17.9	14.4	14.5	13.4	14.6		33.2	40.4	39.4	49.6	44.2	59.4
Carbonate																												
Ammonia (NH3-N)										0.042												<0.010						
Nitrogen Total (N)										3.7												24						
Chloride (Cl)		362	436	406	361	398	413	425	404	455	380	387		325	302	401	400	426	425	431	428	318	244	317	337	358	379	321
NATA EC		1440	1720	1590	1530	1560	1610	1650	1620	1740	1630	1840		1410	1410	1560	1530	1570	1600	1560	1570	1440	1100	1370	1480	1610	1620	1490
O2										7.1												7.5						
Phosphate as PO4-P																												
Phosphorus Total (P)										0.02												<0.005						
NATA pH		6	6.1	6.1	6.2	6.2	6.4	6.1	6.4	6.2	6.4	6.2		6.2	6.4	6.3	6.1	6.2	6.1	6.1	6.2	6.3	6.3	6.3	6.3	6.2	6.3	6.3
Potassium (K)		0.7	0.5	1.4	1.1	1.3	1.5	1.3	1.2		1	0.6		0.5	0.4	0.9	1	1.4	1.6	1.5	1.4		0.3	3.2	1.6	1.4	0.6	0.4
Sodium (Na)		134	185	216	207	214	219	224	230		206	185		130	138	180	190	211	221	204	201		121	159	172	181	171	126
Sulphate (SO_4^{2-})		120	150	100	110	130	130	130	120	130	140	130		131	130	96	100	100	100	100	100	130	99	120	130	120	110	140
TDS		810	930	900	830	820	900	860	840	950	850	860		800	730	840	860	870	910	890	910	810	620	720	790	890	870	690
Radium 226																												
Radium 228																												
Acrylamide																												
Eh																												
Sulphate:Chloride Ratio	#DIV/0!	0.33	0.34	0.25	0.30	0.33	0.31	0.31	0.30	0.29	0.37	0.34		0.40	0.43	0.24	0.25	0.23	0.24	0.23	0.23	0.41	0.41	0.38	0.39	0.34	0.29	0.44
Chloride:Sulphate Ratio	#DIV/0!	3.02	2.91	4.06	3.28	3.06	3.18	3.27	3.37	3.50	2.71	2.98		2.48	2.32	4.18	4.00	4.26	4.25	4.31	4.28	2.45	2.46	2.64	2.59	2.98	3.45	2.29

YA_MB010S	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23
Date	12/01/2021	4/02/2021	10/03/2021	14/04/2021	6/05/2021	3/06/2021	6/07/2021	9/08/2021	13/09/2021	14/10/2021	10/11/2021	14/12/2021	11/01/2022	10/02/2022	9/03/2022	6/04/2022	12/05/2022	16/06/2022	19/07/2022	9/08/2022	26/09/2022	20/10/2022	9/11/2022	30/11/2022	11/01/2023
Casing Height above topo	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Depth of bore	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40	5.40
SWL (m)	2.27	2.37	2.39	2.4	2.34	1.99	1.63			1.47	1.67	2.08	2.29	2.48	2.65	2.74	2.77	2.33	2	0.9	1.52	1.28	2	2.2	2.55
m AHD	26.99	26.89	26.87	26.86	26.92	27.27	27.63			27.79	27.59	27.18	26.97	26.78	26.61	26.52	26.49	26.93	27.26	28.36	27.74	27.98	27.26	27.06	26.71
Purge	19	18	18	18	18	20	23			24	22	20	19	18	18	16	17	19	21	25	25	25	20	20	30
Field pH	5.94	5.83	6.07	6.04	6.04	6.07	6.06			6.26	6.25	6.12	6.18	6	6.04	6	5.95	6.33	6.28	7.06	6.16	5.7	6.07	6.2	6.17
Temp	20.5	21.7	21.5	20.6	19.4	18.2	15.9			15.5	17.3	19.8	22.1	22.4	22.7	19.3	18.7	17.1	15.4	16.7	16.4	17.2	18.4	20.1	19.9
Field Cond (EC)	1700.00	1730.00	1750.00	1670.00	1750.00	1810.00	1570.00			1520.00	1370.00	1650.00	1780.00	1810.00	1980.00	1850.00	1880.00	1820.00	1700.00	1540.00	1050.00	940.00	1010.00	1130.00	1470.00
Field Salinity	850	874	870	830	870	910	790			760	690	820	890	900	990	910	960	910	870	770	530	520	550	560	730
Field ROP	354	434	429	495	414	403	421			363	349		372	413	356	359	360	362	348	361	330	310	230	240	202
Field Alkalinity	33	30	39	21	33	39	36			33	45	45	48	58	60	30	33	69	33	24	45	45	56	39	45
Field TTA	40.000	30	28	23	29	45	70			50	75	35	40	60	110	110	80	85	33	55	80	80	60	70	80
Field DO %S	18.6	20.2	24.4	33.5	34.5																				
Comments								no access	no access																
Aluminium Filtered (Al)	<0.005	0.0022	0.017	0.01	<0.005	<0.005	0.016			0.009	0.016	0.007	<0.005	0.032	0.031	0.025	0.017	0.024	0.041	0.033	0.007	0.01	0.011	0.19	0.031
Aluminium Total (Al)												0.052						0.26			0.12				3.3
Arsenic (As)						<0.0001						0.0001						<0.0001			<0.0001			0.0001	0.0002
Arsenic (As) Total																		0.0002			0.0001				0.0004
Boron (B)																									
Cadmium (Cd)						<0.0001						<0.0001						<0.0001			<0.0001			<0.0001	<0.0001
Cadmium (Cd) Total																		<0.0001			<0.0001				<0.0001
Calcium (Ca)																									
Chromium VI (Cr)												<.004						<0.004			<0.004			<0.004	<0.004
Chromium VI (Cr) Total																		<0.004			<0.004				<0.004
Chromium (Cr)																		0.0001			0.0001				0.0002
Chromium Total (Cr)						0.0001						0.0002						0.0003			<0.0001			0.0006	0.0029
Cobolt (Co)						0.001						0.0017						0.001			0.0008				0.0018
Cobolt (Co) Total																		0.001			0.0008			0.0006	0.0019
Copper (Cu)						<0.0001						0.0044						0.0009			0.0003			0.0009	0.0006
Copper (Cu) Total																		0.0011			0.0002				0.0007
Iron Filtered (Fe)	0.210	0.25	0.23	0.44	0.23	0.95	0.98			0.57	1.6	0.64	0.082	3.1	3.5	4.4	2.4	0.71	0.58	1.2	0.48	0.86	0.57	0.29	2.3
Iron Total (Fe)												0.67						1.1			0.6			0.42	7.3
Lead (Pb)																		0.0002			<0.0001				0.0002
Manganese (Mn)	0.002	0.003	0.003	0.003	0.003	0.007	0.005			0.049	0.17	0.031	0.005	0.013	0.013	0.011	0.033	0.0051	0.005	0.006	0.013	0.005	0.002	0.002	0.0079
Magnesium (Mg)	47.7	67.6	68	67.9	69.2							55.3	57.8	62.1	60.1	55.2	47.7	65.8	67	59.6	32.2	29.5	33.9	39.6	49.9
Mercury (Hg)						<0.00005						<0.00005						<0.00005			<0.00005			<0.00005	<0.00005
Mercury (Hg) Total																		0.00005			<0.00005				<0.00005
Molybdenum (Mo)																									
Nickel (Ni)						<0.0005						<0.0005						0.0005			0.0005			<0.0005	0.0009
Nickel (Ni) Total																		0.0005			0.0005				0.0018
Selenium (Se)						<0.0002						<0.0002						<0.0002			<0.0002			<0.0002	<0.0002
Selenium (Se) Total																		<0.0002			<0.0002				0.0005
Uranium (U						<0.0001						<0.0001						<0.0001			<0.0001				<0.0001
Uranium (U Total																		<0.0001			<0.0001			<0.0001	0.0006
Zinc (Zn)						<0.005						<0.005						0.007			0.004				0.009
Zinc (Zn) Total																		0.007			<0.005			0.007	<0.005
Thallium (Tl)						<0.0001						<0.0001						<0.0001			<0.0001				<0.0001
Thallium (Tl) Total																		<0.0001			<0.0001			<0.0001	<0.0001
CaCO3 (Acidity)	24	17	27	16	20	29	27			33	58	30	15	45	56	53	26	21	22	19	46	31	36	17	59
CaCO3 (Alkalinity)	30	55	26	17	22	25	30			49	78	37	31	40	44	43	40	23	26	39	41	33	31	30	39
Bicarbonate	30	55	26	17	22							37	31	40	44	43	40	23	26	39	41	33	31	30	39
Calcium	41.6	35.4	31.9	37.1	43.1							60.3	59	21.7	18.6	16	15.5	57	58.3	50.3	46	43.8	55	69.9	25.1
Carbonate																									
Ammonia (NH3-N)																									
Nitrogen Total (N)																									
Chloride (Cl)	384	420	1010	339	365	400	326			285	237	294	293	420	392	389	402	332	300	296	161	145	145	143	322
NATA EC	1700	1700	3340	1630	1690	1770	1460			1440	1270	1500	1610	1710	1660	1620	1580	1570	1420	1430	1010	956	1010	1070	1410
O2																									
Phosphate as PO4-P																									
Phosphorus Total (P)																									
NATA pH	6.4	6.5	6.2	6.4	6.3	6.3	6.3			6.4	6.3	6.2	6.4	6.2	6.3	6.6	6.4	6.5	6.3	6.6	6.1	6.4	6.8	6.9	6.2
Potassium (K)	0.4	1	1	1	0.8							4.2	1.5	2.1	2.1	1.9	2.3	1.3	1.2	5.9	16	12.8	6.7	2.5	2.2
Sodium (Na)	154	207	205	188	188	187	172			158	123	155	158	216	223	206	226	168	166	163	101	102	92.9	99.2	193
Sulphate (SO_4^{2-})	160	140	150	140	150	160	140			150	140	190	210	160	160	140	130	190	170	170	150	150	160	170	150
TDS	900	930	960	950	900	1100	910			700	640	750	880	860	800	780	790	810	730	770	570	540	590	610	730
Radium 226		0.03				0.02						0.02						0.01			<0.01				<0.01
Radium 228		<0.08				<0.08						0.08						<0.08			<0.08				<0.08
Acrylamide		<0.1																							
Eh																		388			420				293
Sulphate:Chloride Ratio	0.42	0.33	0.15	0.41	0.41	0.40	0.43			0.53	0.59	0.65	0.72	0.38	0.41	0.36	0.32	0.57	0.57	0.57	0.93	1.03	1.10	1.19	0.47
Chloride:Sulphate Ratio	2.40	3.00	6.73	2.42	2.43	2.50	2.33			1.90	1.69	1.55	1.40	2.63	2.45	2.78	3.09	1.75	1.76	1.74	1.07	0.97	0.91	0.84	2.15

YA_MB011S

YA_MB011S		Triggers	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19
Date																															
Casing Height above topo	m																														
Depth of bore	m																														
SWL (m)	m (from top of casing)																														
m AHD																															
Purge	L																														
Field pH		<5																													
Temp	degrees C																														
Field Cond (EC)	uS/cm	>3943.12																													
Field Salinity	ppm																														
Field ROP	mv																														
Field Alkalinity		<46.48																													
Field TTA		>129.59																													
Field DO %S																															
Comments																															
Aluminium Filtered (Al)	mg/L	>1																													
Aluminium Total (Al)	mg/L																														
Arsenic (As)	mg/L																														
Arsenic (As) Total	mg/L																														
Boron (B)	mg/L																														
Cadmium (Cd)	mg/L																														
Cadmium (Cd) Total	mg/L																														
Calcium (Ca)	mg/L																														
Chromium VI (Cr)	mg/L																														
Chromium VI (Cr) Total	mg/L																														
Chromium (Cr)	mg/L																														
Chromium Total (Cr)	mg/L																														
Cobolt (Co)	mg/L																														
Cobolt (Co) Total	mg/L																														
Copper (Cu)	mg/L																														
Copper (Cu) Total	mg/L																														
Iron Filtered (Fe)	mg/L	>11.11																													
Iron Total (Fe)	mg/L																														
Lead (Pb)	mg/L																														
Manganese (Mn)	mg/L	>0.66																													
Magnesium (Mg)	mg/L																														
Mercury (Hg)	mg/L																														
Mercury (Hg) Total	mg/L																														
Molybdenum (Mo)	mg/L																														
Nickel (Ni)	mg/L																														
Nickel (Ni) Total	mg/L																														
Selenium (Se)	mg/L																														
Selenium (Se) Total	mg/L																														
Uranium (U)	mg/L																														
Uranium (U) Total	mg/L																														
Zinc (Zn)	mg/L																														
Zinc (Zn) Total	mg/L																														
Thallium (Tl)	mg/L																														
Thallium (Tl) Total	mg/L																														
CaCO3 (Acidity)	mg/L																														
CaCO3 (Alkalinity)	mg/L																														
Bicarbonate	mg/L																														
Calcium	mg/L																														
Carbonate	mg/L																														
Ammonia (NH3-N)	mg/L																														
Nitrogen Total (N)	mg/L																														
Chloride (Cl)	mg/L	>1177.81																													
NATA EC	uS/cm																														
O2	mg/L																														
Phosphate as PO4-P	mg/L																														
Phosphorus Total (P)	mg/L																														
NATA pH																															
Potassium (K)	mg/L																														
Sodium (Na)	mg/L																														
Sulphate (SO_4^{2-})	mg/L	>172.19																													
Eh	mg/L																														
TDS	mg/L	>2013.8																													
Radium 226	Bq/L																														
Radium 228	Bq/L																														
Acrylamide																															
Sulphate:Chloride Ratio		>0.5																													
Chloride:Sulphate Ratio		<2.0																													

YA_MB011S	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Date	19/06/2019				22/10/2019	########	########	########	########	########	9/04/2020	########	9/06/2020	9/07/2020	10/08/2020	9/09/2020	13/10/2020	9/11/2020	8/12/2020
Casing Height above topo	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45
Depth of bore	8.67	8.67	8.67	8.67	8.67	8.67	8.67	8.67	8.67	8.67	8.67	8.67	8.67	8.67	8.67	8.67	8.67	8.67	8.67
SWL (m)	1.13				1.41	1.57	1.74	1.75	1.78	1.79	1.74	1.5	1.35	0.8	0.53	0.56	1.23	1.46	1.56
m AHD	24.69				23.73	23.57	23.4	23.39	23.36	23.35	23.4	23.64	23.79	24.34	24.61	24.58	23.91	23.68	23.58
Purge	>500 L				348	336	333	166	165	165	166	172	176	189	195	195	179	173	171
Field pH	6.10				6	6	6.07	6.03	6	5.96	5.75	5.88	6	6.05	5.87	5.85	5.78	5.96	5.81
Temp	16.7				17.9	17.2	18.9	19.3	20.3	20	20.4	18.7	18.2	17.2	17.2	17.7	19.5	17.3	19.9
Field Cond (EC)	4060.00				3920.00	3860.00	3570.00	3530.00	3560.00	3520.00	3530.00	3390.00	2820.00	2960.00	3370.00	3290.00	3140.00	3340.00	3360.00
Field Salinity	2040				1960	1930	1780	1760	1780	1760	1770	1690	1410	1480	1680	1640	1720	1670	1680
Field ROP					272	306	321	398	403	383	469	336	387	346	351	350	359	371	386
Field Alkalinity					54	66	72	54	60	63	57	60	48	54	63	63	66	63	57
Field TTA					100	100	130	115	120	110	120	85	75	95	115	110	105	105	105
Field DO %S					19.3	18.8	22.1	25.5	19.4	16.1	15.9	16.9	16.9	16.5	13.3	18.9	10.9	15.2	16.3
Comments	L9	No Access	No Access	No Access															
Aluminium Filtered (Al)	0.007				0.008	0.016	0.007	0.014	0.013	0.014	0.023	0.009	<0.005	0.011	0.021	0.006	0.009	0.014	<0.005
Aluminium Total (Al)	0.029												0.014						
Arsenic (As)	0.0054												0.0007						
Arsenic (As) Total																			
Boron (B)																			
Cadmium (Cd)	<0.0001												0.0002						
Cadmium (Cd) Total																			
Calcium (Ca)																			
Chromium VI (Cr)																			
Chromium VI (Cr) Total																			
Chromium (Cr)																			
Chromium Total (Cr)	<0.0001												<0.0001						
Cobolt (Co)																			
Cobolt (Co) Total																			
Copper (Cu)																			
Copper (Cu) Total																			
Iron Filtered (Fe)	3.7				9.9	9.6	9.2	9	9.5	11	10	1.1	0.094	0.19	4.1	6	7.1	7.5	3.6
Iron Total (Fe)	4.4												0.41						
Lead (Pb)																			
Manganese (Mn)	0.32				0.28	0.45	0.48	0.65	0.58	0.61	0.44	0.78	0.32	0.28	0.24	0.22	0.19	0.29	0.28
Magnesium (Mg)					64	64	61.3	61.1	62.5	63.8	61.8	64.5		56.1	60.2	60.5	53.8	56.4	58.8
Mercury (Hg)																			
Mercury (Hg) Total																			
Molybdenum (Mo)																			
Nickel (Ni)	0.021												0.027						
Nickel (Ni) Total																			
Selenium (Se)	0.0008												0.0006						
Selenium (Se) Total																			
Uranium (U)																			
Uranium (U) Total																			
Zinc (Zn)	0.005												0.007						
Zinc (Zn) Total																			
Thallium (Tl)																			
Thallium (Tl) Total																			
CaCO3 (Acidity)	53				98	63	85	72	77	57	71	64	43	52	70	56	74	67	56
CaCO3 (Alkalinity)	38				58	46	55	46	56	42	41	49	37	47	50	51	53	44	46
Bicarbonate					58	46	55	46	56	42	41	49		47	50	51	53	44	46
Calcium					8.3	8.7	8.3	8.1	8.2	8.3	7.8	9.2		24.7	9.6	8.3	6.9	7.5	8.5
Carbonate																			
Ammonia (NH3-N)	0.015												0.12						
Nitrogen Total (N)	8.8												38						
Chloride (Cl)	1120				1100	1100	1060	1000	1060	1070	1050	1050	702	745	986	993	1000	1000	980
NATA EC	3810				3730	3620	3570	3280	3420	3410	3400	3420	2760	2890	3220	3330	3280	3260	3230
O2	3.6												5,2						
Phosphate as PO4-P																			
Phosphorus Total (P)	0.007												0.017						
NATA pH	6.2				6.2	6.2	6.2	6.1	6.3	6.1	6	6.2	6.2	6.3	6.2	6.4	6.2	6.2	6.3
Potassium (K)					5.7	6.7	6.1	5.9	6.3	6	5.9	6.7		72.4	13.2	7.8	6.3	6.6	8.2
Sodium (Na)					620	625	604	591	594	592	559	543		426	551	575	510	516	505
Sulphate (SO_4^{2-})	170				150	140	130	130	140	140	140	150	170	180	140	130	120	110	140
Eh																			
TDS	2000				1900	1900	1900	1900	1800	1900	1800	1900	1600	1600	1700	1800	1800	1800	1500
Radium 226																			
Radium 228														* Lab retested on above					
Acrylamide																			
Sulphate:Chloride Ratio														0.24	0.14	0.13	0.12	0.11	0.14
Chloride:Sulphate Ratio														4.14	7.04	7.64	8.33	9.09	7.00

YA_MB011S	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23
Date	13/01/2021	8/02/2021	9/03/2021	19/04/2021	10/05/2021	8/06/2021	7/07/2021	9/08/2021	16/09/2021	19/10/2021	8/11/2021	21/12/2021	10/01/2022	10/02/2022	1/03/2022	7/04/2022	18/05/2022	15/06/2022	19/07/2022	11/08/2022	14/09/2022	19/10/2022	10/11/2022	1/12/2022	11/01/2023
Casing Height above topo	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45
Depth of bore	8.67	8.67	8.67	8.67	8.67	8.67	8.67	8.67	8.67	8.67	8.67	8.67	8.67	8.67	8.67	8.67	8.67	8.67	8.67	8.67	8.67	8.67	8.67	8.67	8.67
SWL (m)	1.71	1.5	1.53	1.43	1.29	1.05	0.53			1.12	1.32	1.66	1.63	2.45	2.7	2.53	2.15	1.66	1.32	0.9	0.6	1.61	1.79	1.87	2
m AHD	23.43	23.64	23.61	23.71	23.85	24.09	24.61			24.02	23.82	23.48	23.51	22.69	22.44	22.61	22.99	23.48	23.82	24.24	24.54	23.53	23.35	23.27	23.14
Purge	167	172	171	174	177	183	195			181	176	168	169	150	142	145	156	168	176	186	195	169	167	160	140
Field pH	5.85	5.95	5.96	5.91	6.01	5.97	5.97			6.01	6.04	6.04	6.1	5.82	6.01	5.84	6.21	6.11	5.7	5.98	6.09	5.91	6.09	6.07	5.94
Temp	19.1	20.2	20.6	19.7	19.8	17.4	17.3			16.6	18	17.7	18.4	21.5	20.1	20.4	19.5	18.5	17.5	16.1	16.4	18	18	17.7	19.3
Field Cond (EC)	3280.00	3330.00	3170.00	3180.00	3290.00	3250.00	3340.00			3550.00	3460.00	3520.00	3500.00	3400.00	3320.00	3930.00	3190.00	3640.00	4040.00	3570.00	2630.00	3270.00	3090.00	3380.00	3380.00
Field Salinity	1640	1620	1590	1590	1640	1620	1670			1780	1730	1760	1750	1710	1660	1690	1640	1830	2050	1720	1320	1630	1690	1690	1690
Field ROP	400	415	452	467	363	417	438			432	436	357	366	441	107	387	342	362	399	398	303	280	280	320	256
Field Alkalinity	51	60	57	57	69	60	60			48	54	66	60	72	66	60	66	39	24	30	30	60	54	54	60
Field TTA	105	85	115	98	120	110	100			100	95	110	144	145	146	100	100	85	90	100	55	110	60	90	100
Field DO %S	16.8	19.4	18.6	15.9	18.5																				
Comments								no access	no access																
Aluminium Filtered (Al)	0.006	0.007	0.014	0.011	<0.005	<0.005	0.008			0.012	0.019	0.016	0.014	0.018	0.038	0.013	0.018	<0.005	0.009	0.022	0.018	<0.005	0.011	0.014	0.011
Aluminium Total (Al)												0.016						0.014			0.018			0.025	0.028
Arsenic (As)												0.0023						0.0005			0.0004				0.0012
Arsenic (As) Total																		0.0011			0.0006			0.0012	0.0014
Boron (B)																									
Cadmium (Cd)												<0.0001						0.0002			0.0003				0.0002
Cadmium (Cd) Total																		0.0002			0.0003			0.0003	0.0002
Calcium (Ca)																									
Chromium VI (Cr)												<.004						<.004			<0.004				<0.004
Chromium VI (Cr) Total																		<0.001			<0.004			<0.004	<0.004
Chromium (Cr)																		0.0001			<0.0001				0.0002
Chromium Total (Cr)												0.0001						<0.0001			0.0001			0.0001	0.0003
Cobolt (Co)												0.009						0.012			0.047				0.036
Cobolt (Co) Total																		0.012			0.047			0.044	0.036
Copper (Cu)												0.0073						0.0003			0.0004			0.0015	0.0028
Copper (Cu) Total																		0.0004			0.0004				0.0016
Iron Filtered (Fe)	6.4	0.31	8.8	3.1	7.7	5.3	8.4			9.9	9.1	9.5	9.3	7.6	7.3	5.9	5.6	<0.005	0.057	0.7	0.17	1.5	1.1	1.3	2.5
Iron Total (Fe)												9.6						0.5			0.56			1.8	3.1
Lead (Pb)																		<0.0001			<0.0001				<0.0001
Manganese (Mn)	0.3		0.35	0.47	0.29	0.28	0.21			0.22	0.18	0.24	0.24	0.29	0.24	0.17	0.19	0.2	0.092	0.059	0.083	0.150	0.16	0.16	0.16
Magnesium (Mg)	62.1	60.6	60.1	54.1	54.6							60.8	57.8	59.6	56.7	45.2	48.2	67.8	109	65.7	63.5	58	66.5	60.3	63.2
Mercury (Hg)												<.00005						0.00008			<0.00005				<0.00005
Mercury (Hg) Total																		0.00008			<0.00005			<0.00005	<0.00005
Molybdenum (Mo)																									
Nickel (Ni)												0.0056						0.0068			0.039			0.033	0.025
Nickel (Ni) Total																		0.0068			0.039				0.025
Selenium (Se)												<.0002						0.0005			0.0012				0.0007
Selenium (Se) Total																		0.0006			0.0014			0.0008	0.0007
Uranium (U)												0.0014						0.0012			0.0009				0.0013
Uranium (U) Total																		0.0014			0.0011			0.0019	0.0015
Zinc (Zn)												0.017						0.003			0.005				0.017
Zinc (Zn) Total																		0.005			0.005			0.011	0.013
Thallium (Tl)												0.0005						0.0011			0.0011				0.0007
Thallium (Tl) Total																		0.001			0.0011			0.0008	0.0007
CaCO3 (Acidity)	63	65	73	74	57	73	59			79	89	87	76	56	78	69	62	54	20	34	40	55	62	37	55
CaCO3 (Alkalinity)	55	52	57	47	54	42	76			42	55	53	53	45	51	55	62	33	13	36	41	52	50	51	54
Bicarbonate	55	52	57	47	54							53	53	45	51	55	62	33	13	36	41	52	50	51	54
Calcium	8.8	8.1	8	8.7	7.5							7.9	7.5	7.8	7.1	5.6	6	8.6	80	78.7	68.8	23.6	20.3	14.6	13.9
Carbonate																									
Ammonia (NH3-N)																									
Nitrogen Total (N)																									
Chloride (Cl)	988	960	925	924	953	993	968			979	969	984	966	985	951	848	842	1100	898	790	642	923	981	959	958
NATA EC	3270	3170	3080	3100	3260	3240	3150			3360	3350	3380	3350	3350	3250	2870	2960	3580	3650	3160	2680	3010	3220	3150	3360
O2																									
Phosphate as PO4-P																									
Phosphorus Total (P)																									
NATA pH	6.3	6.3	6.2	6.2	6.2	6.2	6.3			6.4	6.1	6.5	6.1	6.1	6.3	6.7	6.4	6.3	6.3	6.2	6.2	6.4	6.8	6.7	6.2
Potassium (K)	8	7.7	7.4	6.9	6.4							6.5	6	6.7	6.2	5.1	5.3	6.9	30.4	30.8	21.3	11.6	10.7	8.7	8.9
Sodium (Na)	550	553	581	509	514	551	532			603	567	578	574	574	613	513	534	628	590	524	456	569	567	547	606
Sulphate (SO_4^{2-})	130	120	130	100	120	130	130			140	120	140	140	140	150	130	120	150	390	290	280	180	180	180	180
Eh																		523			439				322
TDS	1700	1700	1700	1700	1600	1800	1700			1600	1700	1800	1700	1600	1600	1400	1500	1800	1800	1700	1500	1800	1700	1700	1700
Radium 226												0.06						0.06			0.02			0.03	
Radium 228												<0.08						<0.08			<0.08			<0.08	
Acrylamide																									
Sulphate:Chloride Ratio	0.13	0.13	0.14	0.11	0.13	0.13	0.13	#DIV/0!	#DIV/0!	0.14	0.12	0.14	0.14	0.14	0.16	0.15	0.14	0.14	0.43	0.37	0.44	0.20	0.18	0.19	0.19
Chloride:Sulphate Ratio	7.60	8.00	7.12	9.24	7.94	7.64	7.45	#DIV/0!	#DIV/0!	6.99	8.08	7.03	6.90	7.04	6.34	6.52	7.02	7.33	2.30	2.72	2.29	5.13	5.45	5.33	5.32

YA_MB012S		Triggers	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19
Date																																19/06/2020			
Casing Height above topo	m																															0.45	0.45	0.45	0.45
Depth of bore	m																															8.96	8.96	8.96	8.96
SWL (m)	m (from top of casing)																															Flowing			
m AHD																																22.79			
Purge	L																															>500 L			
Field pH		<5																														5.31			
Temp	degrees C																															20.3			
Field Cond (EC)	uS/cm	>1994.23																														1910.00			
Field Salinity	ppm																															950			
Field ROP	mv																																		
Field Alkalinity		<53.64																																	
Field TTA		>262.48																																	
Field DO %S																																			
Comments																																L9	No Access	No Access	No Access
Aluminium Filtered (Al)	mg/L	>1																														0.041			
Aluminium Total (Al)	mg/L																															0.16			
Arsenic (As)	mg/L																															0.0004			
Arsenic (As) Total	mg/L																																		
Boron (B)	mg/L																																		
Cadmium (Cd)	mg/L																															<0.0001			
Cadmium (Cd) Total	mg/L																																		
Calcium (Ca)	mg/L																																		
Chromium VI (Cr)	mg/L																															<0.0001			
Chromium VI (Cr) Total	mg/L																																		
Chromium (Cr)	mg/L																																		
Chromium (Cr) Total	mg/L																																		
Cobolt (Co)	mg/L																																		
Cobolt (Co) Total	mg/L																																		
Copper (Cu)	mg/L																																		
Copper (Cu) Total	mg/L																																		
Iron Filtered (Fe)	mg/L	>33.94																														28			
Iron Total (Fe)	mg/L																															35			
Lead (Pb)	mg/L																																		
Manganese (Mn)	mg/L	>1.08																														0.96			
Magnesium (Mg)	mg/L																																		
Mercury (Hg)	mg/L																																		
Mercury (Hg) Total	mg/L																																		
Molybdenum (Mo)	mg/L																																		
Nickel (Ni)	mg/L																															0.0098			
Nickel (Ni) Total	mg/L																																		
Selenium (Se)	mg/L																															<0.0002			
Selenium (Se) Total	mg/L																																		
Uranium (U)	mg/L																																		
Uranium (U) Total	mg/L																																		
Zinc (Zn)	mg/L																															0.02			
Zinc (Zn) Total	mg/L																																		
Thallium (Tl)	mg/L																																		
Thallium (Tl) Total	mg/L																																		
CaCO3 (Acidity)	mg/L																															120			
CaCO3 (Alkalinity)	mg/L																															28			
Bicarbonate	mg/L																																		
Calcium	mg/L																																		
Carbonate	mg/L																																		
Ammonia (NH3-N)	mg/L																															<0.010			
Nitrogen Total (N)	mg/L																															0.074			
Chloride (Cl)	mg/L	>529.35																														469			
NATA EC	uS/cm																															1630			
O2	mg/L																															3.5			
Phosphate as PO4-P	mg/L																																		
Phosphorus Total (P)	mg/L																															0.076			
NATA pH																																5.7			
Potassium (K)	mg/L																																		
Sodium (Na)	mg/L																																		
Sulphate (SO_4^{2-})	mg/L	>58.34																														50			
TDS	mg/L	>1021.12																														860			
Radium 226																																			
Radium 228																																			
Acrylamide																																			
Eh	mV																																		
Sulphate:Chloride Ratio		>0.5																																	
Chloride:Sulphate Ratio		<2																																	

YA_MB012S	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23
Date	22/10/2019	13/11/2019	16/12/2019	14/01/2020	1202/2020	12/03/2020	9/04/2020	7/05/2020	9/06/2020	9/07/2020	10/08/2020	9/09/2020	13/10/2020	9/11/2020	8/12/2020	13/01/2021	8/02/2021	9/03/2021	19/04/2021	10/05/2021	8/06/2021	7/07/2021	11/08/2021	13/09/2021	18/10/2021	10/11/2021	20/12/2021	13/01/2022	9/02/2022	1/03/2022	5/04/2022	12/05/2022	21/06/2022	19/07/2022	10/08/2022	13/09/2022	19/10/2022	10/11/2022	1/12/2022	11/01/2023
Casing Height above topo	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45
Depth of bore	8.96	8.96	8.96	8.96	8.96	8.96	8.96	8.96	8.96	8.96	8.96	8.96	8.96	8.96	8.96	8.96	8.96	8.96	8.96	8.96	8.96	8.96	8.96	8.96	8.96	8.96	8.96	8.96	8.96	8.96	8.96	8.96	8.96	8.96	8.96	8.96	8.96	8.96	8.96	8.96
SWL (m)	0	0.17	0.35	0.39	0.43	0.44	0.41	0.3	0.13	0	0	0	0.05	0.33	0.29	0.46	0.44	0.54	0.42	0.14	0.05	0	0	0	0	0	0.41	0.44	3.46	3.14	1.65	1.6	1.09	0.68	0.3	0.64	0.92	1.13	1.15	1.2
m AHD	23.24	23.07	22.89	22.85	22.81	22.8	22.83	22.94	23.11	23.24	23.24	23.24	23.19	22.91	22.95	22.78	22.80	22.70	22.82	23.10	23.19	23.24	23.24	23.24	23.24	23.24	22.83	22.80	19.78	20.10	21.59	21.64	22.15	22.56	22.94	22.60	22.32	22.11	22.09	22.04
Purge	430	421	413	205	204	204	205	208	212	215	215	215	214	207	208	204	204	202	205	211	214	215	215	215	215	215	205	204	132	139	175	175	188	198	204	199	192	187	170	170
Field pH	5.94	5.87	6	5.88	5.85	5.81	5.61	5.63	6.02	6.06	5.81	5.8	5.75	5.85	5.82	5.84	5.82	5.76	5.97	5.95	5.96	5.85	6.06	5.88	5.94	5.96	5.94	5.88	5.86	5.87	5.8	5.96	6.03	5.76	5.99	5.93	5.86	5.84	5.89	5.86
Temp	19	19.3	19.6	18.9	20.5	20.6	19.5	19.2	19.1	17.5	18.7	18.5	20.8	18.3	20.7	19.5	20.7	19.9	17.9	19.6	16.7	18.4	18.2	19	19.6	17.7	20.7	19.3	20.4	20.7	20.6	18.3	19.4	18.7	18.9	16.1	17.9	19.2	19.3	19.9
Field Cond (EC)	1970	2000	1800	1800	1810	1820	1740	1870	1780	1800	1840	1780	1870	1830	1850	1850	1830	1850	1900	1890	1870	1920	1930	1880	1950	1980	1940	2030	1930	1930	2080	2110	1870	2150	1930	1800.00	1860.00	1850.00	1860.00	1890.00
Field Salinity	980	1000	900	900	910	910	870	940	890	900	920	890	930	920	920	920	910	930	950	940	930	960	960	940	980	990	970	1020	960	960	1030	1080	930	1100	960	900	930	930	930	950
Field ROP	290	357	364	323	356	346	474	380	377	348	351	346	347	364	369	392	410	446	457	406	412	436	363	343	387	388	261	362	408	580	326	341	332	382	351	331	320	310	250	235
Field Alkalinity	54	66	102	60	90	102	96	111	81	84	75	90	93	93	72	87	78	93	72	102	84	75	84	69	72	72	99	90	75	87	66	63	66	60	66	80	87	60	69	75
Field TTA	190	200	200	200	225	245	221	235	225	220	250	240	280	225	200	215	175	220	222	240	225	220	200	185	215	220	230	240	240	250	280	220	180	250	280	230	260.0	250	260	260
Field DO %S	19.2	20.4	23.4	25.4	15.8	15.7	15.3	15.9	15.9	20.7	14.6	19.1	9.6	15.4	17.8	17.9	16.1	34.3	16.3	17.7																				
Comments																																								
Aluminium Filtered (Al)	0.029	0.044	0.027	0.036	0.033	0.035	0.088	0.093	0.028	0.034	0.012	0.035	0.034	0.037	0.017	0.023	0.023	0.0035	0.025	0.012	0.011	0.032	0.017	0.02	0.022	0.024	0.016	0.046	0.069	0.047	0.031	0.031	0.016	0.038	0.057	0.043	0.023	0.038	0.047	0.043
Aluminium Total (Al)									0.059																		0.018						0.076			0.21			2.8	1.4
Arsenic (As)									0.0004																		0.0004						0.0004			0.0004				0.0005
Arsenic (As) Total																																	0.0005			0.0008			0.001	0.0008
Boron (B)																																								
Cadmium (Cd)									<0.0001																		<0.0001						<0.0001			<0.0001				<0.0001
Cadmium (Cd) Total																																	<0.0001			<0.0001			<0.0001	<0.0001
Calcium (Ca)																																	6.8			8.4				8.2
Chromium VI (Cr)									<0.0001																		<0.004						<0.004			0.0002				0.0003
Chromium VI (Cr) Total																																	<0.004			<0.004			<0.004	<0.004
Chromium (Cr)																											0.0003						<0.0001			<0.0001				0.0003
Chromium (Cr) Total																																	0.0003			<0.0001			0.0063	<0.004
Cobolt (Co)																											0.004						0.0046			0.0041				0.0046
Cobolt (Co) Total																																	0.0039			0.0038			0.0054	0.0047
Copper (Cu)																											0.0067						0.0001			<0.0011			0.0028	0.005
Copper (Cu) Total																																	0.0016			0.0016				0.0031
Iron Filtered (Fe)	29	30	29	30	29	31	23	28	29	31	30	32	28	30	28	32	31	31	31	26	31	29	32	33	32	32	30	32	28	29	31	30	26	33	31	32	30	29	31	30
Iron Total (Fe)									32																		30						27			32			45	37
Lead (Pb)																																	<0.0001			0.0001				<0.0001
Manganese (Mn)	0.92	0.95	0.91	0.95	0.92	0.98	0.92	0.93	0.89	1	1	1	0.93	0.94	0.93	1	1.1	1	0.99	0.85	1.1	0.91	1	1	1	1	1.1	1	1	1	1.1	1	0.94	1.1	1	1	1.000	0.96	1	0.97
Magnesium (Mg)	33.6	33.3	34.1	34.7	34.6	34.8	34.9	34.2		35.2	34.6	35.4	32.2	32.7	32.2	36.2	35.2	36.5	35.1	30.8							37	36.2	36.4	37.3	38.5	36.8	33.2	40.6	38	38.8	34.7	35.9	33.9	37.5
Mercury (Hg)																											<0.00005						<0.00005			<0.00005			<0.00005	<0.00005
Mercury (Hg) Total																																	<0.00005			<0.00005				<0.00005
Molybdenum (Mo)																																								
Nickel (Ni)									0.0091																		0.0086						0.008			0.0081				0.009
Nickel (Ni) Total																																	0.008			<0.0081			0.01	0.01
Selenium (Se)									<0.0002																		<.0002						<0.0002			<0.0002				<0.0002
Selenium (Se) Total																																	<0.0002			<0.0002			<0.0002	<0.0002
Uranium (U)																											<0.0001						<0.0001			<0.0001				<0.0001
Uranium (U) Total																																	<0.0001			<0.0001			0.0003	0.0002
Zinc (Zn)									0.023																		0.066						0.025			0.023				0.032
Zinc (Zn) Total																																	0.024			0.024			0.038	0.029
Thallium (Tl)																											<0.0001						<0.0001			<0.0001				<0.0001
Thallium (Tl) Total																																	<0.0001			<0.0001			<0.0001	<0.0001
CaCO3 (Acidity)	170	150	150	160	150	100	120	170	140	110	150	120	150	140	100	130	140	160	160	100	150	120	140	100	170	140	170	160	170	160	130	63	130	130	150	140	120	150	86	150
CaCO3 (Alkalinity)	73	74	70	75	76	25	24	66	64	33	75	71	74	35	28	66	50	62	65	68	22	49	25	25	46	64	68	43	22	31	73	31	81	65	59	59	42	49	47	56
Bicarbonate	73	74	70	75	76	25	24	66		33	75	71	74	35	28	66	50	62	65	68							68	43	22	31	73	31	81	65	59	59	42	49	47	56
Calcium	6.7	6.7	6.7	6.6	6.5	6.6	6.8	6.6		7	6.9	7.1	6.3	6.5	6.9	7.6	7	7.3	8.2	6.5							7.9	7.1	7.8	7.6	7.8	7.7	6.8	8.4	8.4	8.4	7	6.5	6.8	8.2
Carbonate																																								
Ammonia (NH3-N)									0.034																															
Nitrogen Total (N)									0.045																															
Chloride (Cl)	499	511	507	475	511	518	502	503	510	508	517	514	523	496	506	513	497	491	490	488	510	507	521	489	494	489	511	508	488	491	500	523	525	519	497	513	509	515	507	508
NATA EC	1750	1760	1760	1710	1720	1670	1640	1730	1730	1690	1780	1770	1750	1740	1710	1740	1760	1780	1780	1810	1730	1770	1770	1740	1720	1830	1830	1800	1750	1770	1800	1760	1800	1800	1800	1810	1790	1730	1640	1780
O2									4.7																															
Phosphate as PO4-P																																								
Phosphorus Total (P)									0.12																															
NATA pH	6.1	6.2	6.2	6.2	6.2	5.7	5.6	6.1	6.1	5.8	6.2	6.3	6.1	6.1	6	6.1	6.2	6.1	6.1	6.1	5.7	6.3	6.6	6	6.1	5.9	6	6	5.4	5.8	6.2	6	6	6.3	5.9	6	6	6.4	6.3	5.8
Potassium (K)	9.3	10.4	9.8	9.1	8.9	9.4	9	9.8		10	10.2	9.5	9	9.2	8.8	10.6	10.4	10.9	9.8	9.2							11.2	9.8	11	10.5	10.8	10.8	9.6	10.9	10.7	11	10.3	10.1	9.8	10.1
Sodium (Na)	262	263	256	258	252	256	247	256		263	261	266	239	243	230	259	269	277	260	235	255	241	270	281	271	261	271	270	267	288	287	288	254	306	288	290	272	260	258	290
Sulphate (SO_4^{2-})	51	51	51	49	53	51	52	53	53	52	53	50	58	56	62	54	54	54	54	54	52	54	53	54	53	52	53	55	52	52	52	53	55	53	52	51	55	53	54	54
TDS	910	930	940	930	900	900	950	970	940	900	860	910	980	940	790	950	930	960	980	910	990	940	970	800	850	540	940	910	900	870	940	890	900	820	900	930	980	860	900	880
Radium 226																											0.03						0.02			0.02			0.02	
Radium 228																											<0.08						<0.08			<0.08			<0.08	
Acrylamide																																								
Eh																																	509			427				283
Sulphate:Chloride Ratio	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.11	0.10	0.10	0.10	0.10	0.11	0.11	0.12	0.11	0.11	0.11	0.11	0.11	0.10	0.11	0.10	0.11	0.11	0.11	0.10	0.11	0.11	0.11	0.10	0.10	0.10	0.10	0.10	0.10	0.11	0.10	0.11	0.11
Chloride:Sulphate Ratio	9.78	10.02	9.94	9.69	9.64	10.16	9.65	9.49	9.62	9.77	9.75	10.28	9.02	8.86	8.16	9.50	9.20	9.09	9.07	9.04	9.81	9.39	9.83	9.06	9.32	9.40	9.64	9.24	9.38	9.44	9.62	9.87	9.55	9.79	9.56	10.06	9.25	9.72	9.39	9.41

Windmill, well and tank on Lot 104. 530m north of Princefield Road. NW of Hester's house. 1m wide concrete well. Winmill runs year round without dropping ~1m below topo
open well

20005101		Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19
Date						31/05/2017	27/06/2017	25/07/2017	15/08/2017	19/09/2017	17/10/2017	14/11/2017	14/12/2017	15/01/2018	13/02/2018	13/03/2018	16/04/2018	9/05/2018	13/06/2018	11/07/2018	13/08/2018	11/09/2018	10/10/2018	12/11/2018	10/12/2018	14/01/2019
Casing Height above topo	m	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40
Depth of bore	m	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30
SWL (m)	m (from top of casing)					1.05	0.85	0.41	0.32	0.67	0.77	1.14	1.3	1.5	1.27	1.49	1.66	1.37	0.26	0.30	0.25	0.31	1.01	1.79	1.74	1.38
m AHD						19.85	20.05	20.49	20.58	20.23	20.13	19.76	19.60	19.40	19.63	19.41	19.24	19.53	20.64	20.60	20.65	20.59	19.89	19.11	19.16	19.52
Purge	L																									
pH																										
Temp	degrees C																									
Cond (EC)	uS/cm																									
Salinity	ppm																									
ROP mv (Field)																										
Alkalinity (Field)																										
TTA																										
Do %S																										
Comments						Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only
Al (filtered)	mg/L																									
Al(Total)	mg/L																									
As	mg/L																									
B	mg/L																									
Cd	mg/L																									
Ca	mg/L																									
Cr	mg/L																									
Co	mg/L																									
Cu	mg/L																									
Fe (Filtered)	mg/L																									
Fe (Total)	mg/L																									
Pb	mg/L																									
Mn	mg/L																									
Mg	mg/L																									
Mercury	mg/L																									
Molybdenum	mg/L																									
Ni	mg/L																									
Se	mg/L																									
U	mg/L																									
Zn	mg/L																									
Fl as F																										
CaCO3 (Acidity)	mg/L																									
CaCO3 (Alkalinity)	mg/L																									
Bicarbonate																										
Calcium																										
Carbonate																										
NH3-N	mg/L																									
Cl	mg/L																									
EC	uS/cm																									
O2	mg/L																									
P	mg/L																									
pH Lab																										
Potassium																										
Sodium																										
Sulphate	mg/L																									
TDS	mg/L																									
N	mg/L																									
Phos	mg/L																									

20005101		Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21
Date		11/09/2019	11/03/2019	10/04/2019	8/05/2019	12/06/2019	12/07/2019	9/08/2019	11/09/2019	9/10/2019	12/11/2019	9/12/2019	13/01/2020	10/02/2020	11/03/2020	24/04/2020	11/05/2020	10/06/2020	10/07/2020	7/08/2020	8/09/2020	14/10/2020	10/11/2020	9/12/2020	15/01/2021	10/02/2021
Casing Height above topo	m	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40
Depth of bore	m	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30
SWL (m)	m (from top of casing)	1.43	1.38	1.45	1.35	0.64	0.27	0.49	0.57	0.81	1.08	1.27	1.39	1.46	1.5	1.41	0.97	0.79	0.3	0.26	0.25	0.84	0.95	1.06	1.29	1.1
m AHD		19.47	19.52	19.45	19.55	20.26	20.63	20.41	20.33	20.09	19.82	19.63	19.51	19.44	19.40	19.49	19.93	20.11	20.60	20.64	20.65	20.06	19.95	19.84	19.61	19.80
Purge	L																									
pH																										
Temp	degrees C																									
Cond (EC)	uS/cm																									
Salinity	ppm																									
ROP mv (Field)																										
Alkalinity (Field)																										
TTA																										
Do %S																										
Comments		Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only
Al (filtered)	mg/L																									
Al(Total)	mg/L																									
As	mg/L																									
B	mg/L																									
Cd	mg/L																									
Ca	mg/L																									
Cr	mg/L																									
Co	mg/L																									
Cu	mg/L																									
Fe (Filtered)	mg/L																									
Fe (Total)	mg/L																									
Pb	mg/L																									
Mn	mg/L																									
Mg	mg/L																									
Mercury	mg/L																									
Molybdenum	mg/L																									
Ni	mg/L																									
Se	mg/L																									
U	mg/L																									
Zn	mg/L																									
Fl as F																										
CaCO3 (Acidity)	mg/L																									
CaCO3 (Alkalinity)	mg/L																									
Bicarbonate																										
Calcium																										
Carbonate																										
NH3-N	mg/L																									
Cl	mg/L																									
EC	uS/cm																									
O2	mg/L																									
P	mg/L																									
pH Lab																										
Potassium																										
Sodium																										
Sulphate	mg/L																									
TDS	mg/L																									
N	mg/L																									
Phos	mg/L																									

20005101		Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23
Date		16/03/2021	1/04/2021	5/05/2021	14/06/2021	6/07/2021	11/08/2021	16/09/2021	15/10/2021	11/11/2021	15/12/2021	13/01/2022	9/02/2022	3/03/2022	5/04/2022	17/05/2022	14/06/2022	19/07/2022	10/08/2022	14/09/2022	20/10/2022	22/11/2022	14/12/2022	14/12/2022
Casing Height above topo	m	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40
Depth of bore	m	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30	3.30
SWL (m)	m (from top of casing)	1.15	1.2	0.83	0.3	0.23	0.23	0.23	2.09	1.78	1.94	2.81	1.46	0.82	1.55	1.6	1.5	2.2	0	0	0.32	0.46	0.88	1.92
m AHD		19.75	19.70	20.07	20.60	20.67	20.67	20.67	18.81	19.12	18.96	18.09	19.44	20.08	19.35	19.30	19.40	18.70	20.90	20.90	20.58	20.44	20.02	18.98
Purge	L																							
pH																								
Temp	degrees C																							
Cond (EC)	uS/cm																							
Salinity	ppm																							
ROP mv (Field)																								
Alkalinity (Field)																								
TTA																								
Do %S																								
Comments		Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only
Al (filtered)	mg/L																							
Al(Total)	mg/L																							
As	mg/L																							
B	mg/L																							
Cd	mg/L																							
Ca	mg/L																							
Cr	mg/L																							
Co	mg/L																							
Cu	mg/L																							
Fe (Filtered)	mg/L																							
Fe (Total)	mg/L																							
Pb	mg/L																							
Mn	mg/L																							
Mg	mg/L																							
Mercury	mg/L																							
Molybdenum	mg/L																							
Ni	mg/L																							
Se	mg/L																							
U	mg/L																							
Zn	mg/L																							
Fl as F																								
CaCO3 (Acidity)	mg/L																							
CaCO3 (Alkalinity)	mg/L																							
Bicarbonate																								
Calcium																								
Carbonate																								
NH3-N	mg/L																							
Cl	mg/L																							
EC	uS/cm																							
O2	mg/L																							
P	mg/L																							
pH Lab																								
Potassium																								
Sodium																								
Sulphate	mg/L																							
TDS	mg/L																							
N	mg/L																							
Phos	mg/L																							

LOT1426 NORTH ~5.5M DEEP.CIRCA 1958. OWNED BASHFORD. well located in creekline near west boundof 1426 north. Nopump or windmill. Dipped to 5m inc 0.5m of concrete well above topo.

Access on foot ---Doublegee prickles

20005114		Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17
Date						31/05/2017	27/06/2017	26/07/2017	15/08/2017	21/09/2017	17/10/2017	13/11/2017	13/12/2017
Casing Height above topo	m	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Depth of bore	m	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50
SWL (m)	m (from top of casing)					3.2		0.56			0.81	1.57	2.1
m AHD						22.53		25.17			24.92	24.16	23.63
Purge	L					dip only		dip only			dip only	dip only	dip only
pH													
Temp	degrees C												
Cond (EC)	uS/cm												
Salinity	ppm												
ROP mv (Field)													
Alkalinity (Field)													
TTA													
Do %S													
Comments									No Access	No Access			
Al (filtered)	mg/L												
Al(Total)	mg/L												
As	mg/L												
B	mg/L												
Cd	mg/L												
Ca	mg/L												
Cr	mg/L												
Co	mg/L												
Cu	mg/L												
Fe (Filtered)	mg/L												
Fe (Total)	mg/L												
Pb	mg/L												
Mn	mg/L												
Mg	mg/L												
Mercury	mg/L												
Molybdenum	mg/L												
Ni	mg/L												
Se	mg/L												
U	mg/L												
Zn	mg/L												
Fl as F													
CaCO3 (Acidity)	mg/L												
CaCO3 (Alkalinity)	mg/L												
Bicarbonate													
Calcium													
Carbonate													
NH3-N	mg/L												
Cl	mg/L												
EC	uS/cm												
O2	mg/L												
P	mg/L												
pH Lab													
Potassium													
Sodium													
Sulphate	mg/L												
TDS	mg/L												
N	mg/L												
Phos	mg/L												

20005114		Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
Date		11/01/2018	12/02/2018	12/03/2018	12/04/2018	8/05/2018	12/06/2018	10/07/2018	9/08/2018	10/09/2018	10/10/2018	8/11/2018	6/12/2018
Casing Height above topo	m	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Depth of bore	m	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50
SWL (m)	m (from top of casing)	2.49	2.66	2.96	3.18	3.26	0.50	0.56			0.89	1.46	1.95
m AHD		23.24	23.07	22.77	22.55	22.47	25.23	25.17			24.84	24.27	23.78
Purge	L	dip only	dip only	dip only	dip only	dip only	dip only	dip only			dip only	dip only	dip only
pH													
Temp	degrees C												
Cond (EC)	uS/cm												
Salinity	ppm												
ROP mv (Field)													
Alkalinity (Field)													
TTA													
Do %S													
Comments									No Access	No Access			
Al (filtered)	mg/L												
Al(Total)	mg/L												
As	mg/L												
B	mg/L												
Cd	mg/L												
Ca	mg/L												
Cr	mg/L												
Co	mg/L												
Cu	mg/L												
Fe (Filtered)	mg/L												
Fe (Total)	mg/L												
Pb	mg/L												
Mn	mg/L												
Mg	mg/L												
Mercury	mg/L												
Molybdenum	mg/L												
Ni	mg/L												
Se	mg/L												
U	mg/L												
Zn	mg/L												
Fl as F													
CaCO3 (Acidity)	mg/L												
CaCO3 (Alkalinity)	mg/L												
Bicarbonate													
Calcium													
Carbonate													
NH3-N	mg/L												
Cl	mg/L												
EC	uS/cm												
O2	mg/L												
P	mg/L												
pH Lab													
Potassium													
Sodium													
Sulphate	mg/L												
TDS	mg/L												
N	mg/L												
Phos	mg/L												

20005114		Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
Date		9/01/2019	7/02/2019	12/03/2019	9/04/2019	7/05/2019	10/06/2019	9/07/2019	8/08/2019	9/09/2019	8/10/2019	7/11/2019	10/12/2019
Casing Height above topo	m	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Depth of bore	m	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50
SWL (m)	m (from top of casing)	2.44	2.85	3.16	3.32	3.39	3.33	0.49	0.64	0.54	1.34	1.9	2.46
m AHD		23.29	22.88	22.57	22.41	22.34	22.40	25.24	25.09	25.19	24.39	23.83	23.27
Purge	L	dip only	dip only	dip only	dip only	dip only	dip only	dip only	dip only	dip only	dip only	dip only	dip only
pH													
Temp	degrees C												
Cond (EC)	uS/cm												
Salinity	ppm												
ROP mv (Field)													
Alkalinity (Field)													
TTA													
Do %S													
Comments													
Al (filtered)	mg/L												
Al(Total)	mg/L												
As	mg/L												
B	mg/L												
Cd	mg/L												
Ca	mg/L												
Cr	mg/L												
Co	mg/L												
Cu	mg/L												
Fe (Filtered)	mg/L												
Fe (Total)	mg/L												
Pb	mg/L												
Mn	mg/L												
Mg	mg/L												
Mercury	mg/L												
Molybdenum	mg/L												
Ni	mg/L												
Se	mg/L												
U	mg/L												
Zn	mg/L												
Fl as F													
CaCO3 (Acidity)	mg/L												
CaCO3 (Alkalinity)	mg/L												
Bicarbonate													
Calcium													
Carbonate													
NH3-N	mg/L												
Cl	mg/L												
EC	uS/cm												
O2	mg/L												
P	mg/L												
pH Lab													
Potassium													
Sodium													
Sulphate	mg/L												
TDS	mg/L												
N	mg/L												
Phos	mg/L												

20005114		Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Date		9/01/2020	10/02/2020	9/03/2020		11/05/2020	8/06/2020	8/07/2020	6/08/2020	7/09/2020	12/10/2020	5/11/2020	7/12/2020
Casing Height above topo	m	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Depth of bore	m	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50
SWL (m)	m (from top of casing)	2.85	3.16	3.28		3.16	2.98	0.47	0.51	0.42	1.28	1.77	2.05
m AHD		22.88	22.57	22.45		22.57	22.75	25.26	25.22	25.31	24.45	23.96	23.68
Purge	L	dip only	dip only	dip only		dip only	dip only	dip only	dip only	dip only	dip only	dip only	dip only
pH													
Temp	degrees C												
Cond (EC)	uS/cm												
Salinity	ppm												
ROP mv (Field)													
Alkalinity (Field)													
TTA													
Do %S													
Comments													
Al (filtered)	mg/L												
Al(Total)	mg/L												
As	mg/L												
B	mg/L												
Cd	mg/L												
Ca	mg/L												
Cr	mg/L												
Co	mg/L												
Cu	mg/L												
Fe (Filtered)	mg/L												
Fe (Total)	mg/L												
Pb	mg/L												
Mn	mg/L												
Mg	mg/L												
Mercury	mg/L												
Molybdenum	mg/L												
Ni	mg/L												
Se	mg/L												
U	mg/L												
Zn	mg/L												
Fl as F													
CaCO3 (Acidity)	mg/L												
CaCO3 (Alkalinity)	mg/L												
Bicarbonate													
Calcium													
Carbonate													
NH3-N	mg/L												
Cl	mg/L												
EC	uS/cm												
O2	mg/L												
P	mg/L												
pH Lab													
Potassium													
Sodium													
Sulphate	mg/L												
TDS	mg/L												
N	mg/L												
Phos	mg/L												

20005114		Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
Date		12/01/2021	4/02/2021	9/03/2021	15/04/2021	5/05/2021	3/06/2021	6/07/2021	9/08/2021	6/09/2021	14/10/2021	4/11/2021	13/12/2021
Casing Height above topo	m	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Depth of bore	m	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50
SWL (m)	m (from top of casing)	2.56	2.85	3.01	3.1	2.78	0.92	0.49			0.76	1.11	1.82
m AHD		23.17	22.88	22.72	22.63	22.95	24.81	25.24			24.97	24.62	23.91
Purge	L	dip only	dip only	dip only	dip only	dip only	dip only	dip only			dip only	dip only	dip only
pH													
Temp	degrees C												
Cond (EC)	uS/cm												
Salinity	ppm												
ROP mv (Field)													
Alkalinity (Field)													
TTA													
Do %S													
Comments									no access	no access			
Al (filtered)	mg/L												
Al(Total)	mg/L												
As	mg/L												
B	mg/L												
Cd	mg/L												
Ca	mg/L												
Cr	mg/L												
Co	mg/L												
Cu	mg/L												
Fe (Filtered)	mg/L												
Fe (Total)	mg/L												
Pb	mg/L												
Mn	mg/L												
Mg	mg/L												
Mercury	mg/L												
Molybdenum	mg/L												
Ni	mg/L												
Se	mg/L												
U	mg/L												
Zn	mg/L												
Fl as F													
CaCO3 (Acidity)	mg/L												
CaCO3 (Alkalinity)	mg/L												
Bicarbonate													
Calcium													
Carbonate													
NH3-N	mg/L												
Cl	mg/L												
EC	uS/cm												
O2	mg/L												
P	mg/L												
pH Lab													
Potassium													
Sodium													
Sulphate	mg/L												
TDS	mg/L												
N	mg/L												
Phos	mg/L												

20005114		Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
Date		12/01/2022	1/02/2022	2/03/2022	5/04/2022	17/05/2022	22/06/2022	21/07/2022	31/08/2022	20/09/2022	19/10/2022	22/11/2022	13/12/2022
Casing Height above topo	m	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Depth of bore	m	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50	5.50
SWL (m)	m (from top of casing)	2.45	2.74	3.05	3.3	3.32	0.6	0.4	0.2	0.22	1.35	1.55	1.62
m AHD		23.28	22.99	22.68	22.43	22.41	25.13	25.33	25.53	25.51	24.38	24.18	24.11
Purge	L	dip only	dip only	dip only	dip only	dip only	dip only	dip only	dip only	dip only	dip only	dip only	dip only
pH													
Temp	degrees C												
Cond (EC)	uS/cm												
Salinity	ppm												
ROP mv (Field)													
Alkalinity (Field)													
TTA													
Do %S													
Comments													
Al (filtered)	mg/L												
Al(Total)	mg/L												
As	mg/L												
B	mg/L												
Cd	mg/L												
Ca	mg/L												
Cr	mg/L												
Co	mg/L												
Cu	mg/L												
Fe (Filtered)	mg/L												
Fe (Total)	mg/L												
Pb	mg/L												
Mn	mg/L												
Mg	mg/L												
Mercury	mg/L												
Molybdenum	mg/L												
Ni	mg/L												
Se	mg/L												
U	mg/L												
Zn	mg/L												
Fl as F													
CaCO3 (Acidity)	mg/L												
CaCO3 (Alkalinity)	mg/L												
Bicarbonate													
Calcium													
Carbonate													
NH3-N	mg/L												
Cl	mg/L												
EC	uS/cm												
O2	mg/L												
P	mg/L												
pH Lab													
Potassium													
Sodium													
Sulphate	mg/L												
TDS	mg/L												
N	mg/L												
Phos	mg/L												

LOT668_BORE. HOUSE well-OWNED SLADE+PARKIN
Sealed Well - No access for camera

20005115		Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
Date						1/06/2017	29/06/2017	26/07/2017	15/08/2017	20/09/2017	18/10/2017	15/11/2017	14/12/2017	15/01/2018	13/02/2018	13/03/2018	16/04/2018	9/05/2018	13/06/2018	11/07/2018	13/08/2018	11/09/2018	10/10/2018	12/11/2018	10/12/2018
Casing Height above topo	m	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Depth of bore	m	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54
SWL (m)	m (from top of casing)					4.1	4.1	3.47	2.49	2.19	2.26	2.57	2.83	3.23	3.49	3.81	4.13	4.27	3.48	3.04	2.25	2.04	2.31	2.63	2.93
m AHD						24.15	24.15	24.78	25.76	26.06	25.99	25.68	25.42	25.02	24.76	24.44	24.12	23.98	24.77	25.21	26.00	26.21	25.94	25.62	25.32
Purge	L																								
pH																									
Temp	degrees C																								
Cond (EC)	uS/cm																								
Salinity	ppm																								
ROP mv (Field)																									
Alkalinity (Field)																									
TTA																									
Do %S																									
Comments							Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only
Al (filtered)	mg/L																								
Al(Total)	mg/L																								
As	mg/L																								
B	mg/L																								
Cd	mg/L																								
Ca	mg/L																								
Cr	mg/L																								
Co	mg/L																								
Cu	mg/L																								
Fe (Filtered)	mg/L																								
Fe (Total)	mg/L																								
Pb	mg/L																								
Mn	mg/L																								
Mg	mg/L																								
Mercury	mg/L																								
Molybdenum	mg/L																								
Ni	mg/L																								
Se	mg/L																								
U	mg/L																								
Zn	mg/L																								
Fl as F																									
CaCO3 (Acidity)	mg/L																								
CaCO3 (Alkalinity)	mg/L																								
Bicarbonate																									
Calcium																									
Carbonate																									
NH3-N	mg/L																								
Cl	mg/L																								
EC	uS/cm																								
O2	mg/L																								
P	mg/L																								
pH Lab																									
Potassium																									
Sodium																									
Sulphate	mg/L																								
TDS	mg/L																								
N	mg/L																								
Phos	mg/L																								

20005115		Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Date		14/01/2019	11/02/2019	11/03/2019	10/04/2019	8/05/2019	12/06/2019	11/07/2019	9/08/2019	11/09/2019	9/10/2019	12/11/2019	9/12/2019	9/01/2020	10/02/2020	11/03/2020	9/04/2020	11/05/2020	10/06/2020	10/07/2020	7/08/2020	8/09/2020	14/10/2020	10/11/2020	9/12/2020
Casing Height above topo	m	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Depth of bore	m	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54
SWL (m)	m (from top of casing)	3.4	3.85	4.22	4.49	4.68	4.64	3.55	3.4	3.29	3.37	3.65	3.92	4.21	4.46	4.74	4.94	4.81	4.58	3.97	3.29	3.06	3.14	3.34	3.5
m AHD		24.85	24.40	24.03	23.76	23.57	23.61	24.70	24.85	24.96	24.88	24.60	24.33	24.04	23.79	23.51	23.31	23.44	23.67	24.28	24.96	25.19	25.11	24.91	24.75
Purge	L																								
pH																									
Temp	degrees C																								
Cond (EC)	uS/cm																								
Salinity	ppm																								
ROP mv (Field)																									
Alkalinity (Field)																									
TTA																									
Do %S																									
Comments		Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only
Al (filtered)	mg/L																								
Al(Total)	mg/L																								
As	mg/L																								
B	mg/L																								
Cd	mg/L																								
Ca	mg/L																								
Cr	mg/L																								
Co	mg/L																								
Cu	mg/L																								
Fe (Filtered)	mg/L																								
Fe (Total)	mg/L																								
Pb	mg/L																								
Mn	mg/L																								
Mg	mg/L																								
Mercury	mg/L																								
Molybdenum	mg/L																								
Ni	mg/L																								
Se	mg/L																								
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Zn	mg/L																								
Fl as F																									
CaCO3 (Acidity)	mg/L																								
CaCO3 (Alkalinity)	mg/L																								
Bicarbonate																									
Calcium																									
Carbonate																									
NH3-N	mg/L																								
Cl	mg/L																								
EC	uS/cm																								
O2	mg/L																								
P	mg/L																								
pH Lab																									
Potassium																									
Sodium																									
Sulphate	mg/L																								
TDS	mg/L																								
N	mg/L																								
Phos	mg/L																								

20005115		Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
Date		15/01/2021	10/02/2021	15/03/2021	1/04/2021	5/05/2021	14/06/2021	6/07/2021	3/08/2021	7/09/2021	15/10/2021	1/11/2021	7/12/2021	6/01/2022	3/02/2022	9/03/2022	7/04/0202	12/05/2022	30/06/2022	26/07/2022	31/08/2022	28/09/2022	20/10/2022	22/11/2022	14/12/2022
Casing Height above topo	m	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Depth of bore	m	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54	8.54
SWL (m)	m (from top of casing)	4.02	4.27	4.54	4.67	4.63	4.22	3.9	2.9	2.58	2.65	2.71	3.06	3.46	3.97	4.38	4.63	4.88	4.32	3.82	2.95	2.8	2.65	2.77	3.38
m AHD		24.23	23.98	23.71	23.58	23.62	24.03	24.35	25.35	25.67	25.60	25.54	25.19	24.79	24.28	23.87	23.62	23.37	23.93	24.43	25.30	25.45	25.60	25.48	24.87
Purge	L																								
pH																									
Temp	degrees C																								
Cond (EC)	uS/cm																								
Salinity	ppm																								
ROP mv (Field)																									
Alkalinity (Field)																									
TTA																									
Do %S																									
Comments		Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only
Al (filtered)	mg/L																								
Al(Total)	mg/L																								
As	mg/L																								
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Cd	mg/L																								
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Co	mg/L																								
Cu	mg/L																								
Fe (Filtered)	mg/L																								
Fe (Total)	mg/L																								
Pb	mg/L																								
Mn	mg/L																								
Mg	mg/L																								
Mercury	mg/L																								
Molybdenum	mg/L																								
Ni	mg/L																								
Se	mg/L																								
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Zn	mg/L																								
Fl as F																									
CaCO3 (Acidity)	mg/L																								
CaCO3 (Alkalinity)	mg/L																								
Bicarbonate																									
Calcium																									
Carbonate																									
NH3-N	mg/L																								
Cl	mg/L																								
EC	uS/cm																								
O2	mg/L																								
P	mg/L																								
pH Lab																									
Potassium																									
Sodium																									
Sulphate	mg/L																								
TDS	mg/L																								
N	mg/L																								
Phos	mg/L																								

LOT 843 WELL. DEPTH 3.7M-SUPERFICIAL. ESTABLISHED ~1914. NORTH OF McLEAY HOUSE

dipped to 3.75m call Jess and Andrew first

20005165		Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18
Date						31/05/2017	27/06/2017	27/07/2017	16/08/2017	21/09/2017	19/10/2017	16/11/2017	18/12/2017	17/01/2018	15/02/2018	15/03/2018	18/04/2018	14/05/2018	14/06/2018
Casing Height above topo	m	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Depth of bore	m	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
SWL (m)	m (from top of casing)					3	2.9	2.36	0.83	1.29	1.14	1.62	2.09	2.38	2.64	2.87	3.07	3.09	2.29
m AHD						20.57	20.67	21.21	22.74	22.28	22.43	21.95	21.48	21.19	20.93	20.70	20.50	20.48	21.28
Purge	L					Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only
pH																			
Temp	degrees C																		
Cond (EC)	uS/cm																		
Salinity	ppm																		
ROP mv (Field)																			
Alkalinity (Field)																			
TTA																			
Do %S																			
Comments																			
Al (filtered)	mg/L																		
Al(Total)	mg/L																		
As	mg/L																		
B	mg/L																		
Cd	mg/L																		
Ca	mg/L																		
Cr	mg/L																		
Co	mg/L																		
Cu	mg/L																		
Fe (Filtered)	mg/L																		
Fe (Total)	mg/L																		
Pb	mg/L																		
Mn	mg/L																		
Mg	mg/L																		
Mercury	mg/L																		
Molybdenum	mg/L																		
Ni	mg/L																		
Se	mg/L																		
U	mg/L																		
Zn	mg/L																		
Fl as F																			
CaCO3 (Acidity)	mg/L																		
CaCO3 (Alkalinity)	mg/L																		
Bicarbonate																			
Calcium																			
Carbonate																			
NH3-N	mg/L																		
Cl	mg/L																		
EC	uS/cm																		
O2	mg/L																		
P	mg/L																		
pH Lab																			
Potassium																			
Sodium																			
Sulphate	mg/L																		
TDS	mg/L																		
N	mg/L																		
Phos	mg/L																		

20005165		Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
Date		11/07/2018	13/08/2018	12/09/2018	10/10/2018	12/11/2018	11/12/2018	14/01/2019	11/02/2019	13/03/2019	10/04/2019	8/05/2019	13/06/2019	11/07/2019	9/08/2019	10/09/2019	9/10/2019	12/11/2019	9/12/2019
Casing Height above topo	m	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Depth of bore	m	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
SWL (m)	m (from top of casing)	1.46	0.57	0.67	1.14	1.58	1.99	2.41	2.66	2.87	3.02	3.17	3.03	2.23	1.98	1.52	1.72	2.09	2.42
m AHD		22.11	23.00	22.90	22.43	21.99	21.58	21.16	20.91	20.70	20.55	20.40	20.54	21.34	21.59	22.05	21.85	21.48	21.15
Purge	L	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only
pH																			
Temp	degrees C																		
Cond (EC)	uS/cm																		
Salinity	ppm																		
ROP mv (Field)																			
Alkalinity (Field)																			
TTA																			
Do %S																			
Comments																			
Al (filtered)	mg/L																		
Al(Total)	mg/L																		
As	mg/L																		
B	mg/L																		
Cd	mg/L																		
Ca	mg/L																		
Cr	mg/L																		
Co	mg/L																		
Cu	mg/L																		
Fe (Filtered)	mg/L																		
Fe (Total)	mg/L																		
Pb	mg/L																		
Mn	mg/L																		
Mg	mg/L																		
Mercury	mg/L																		
Molybdenum	mg/L																		
Ni	mg/L																		
Se	mg/L																		
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Zn	mg/L																		
Fl as F																			
CaCO3 (Acidity)	mg/L																		
CaCO3 (Alkalinity)	mg/L																		
Bicarbonate																			
Calcium																			
Carbonate																			
NH3-N	mg/L																		
Cl	mg/L																		
EC	uS/cm																		
O2	mg/L																		
P	mg/L																		
pH Lab																			
Potassium																			
Sodium																			
Sulphate	mg/L																		
TDS	mg/L																		
N	mg/L																		
Phos	mg/L																		

20005165		Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21
Date		9/01/2020	10/02/2020	10/03/2020	1/04/2020	11/05/2020	10/06/2020	10/07/2020	7/08/2020	10/09/2020	14/10/2020	10/11/2020	9/12/2020	15/01/2021	10/02/2021	17/03/2021	1/04/2021	5/05/2021	9/06/2021
Casing Height above topo	m	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Depth of bore	m	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
SWL (m)	m (from top of casing)	2.74	3.03	3.16	3.22	3.19	3	2.58	1.64	1.1	1.47	1.77	2	2.57	2.82	2.94	2.9	3.04	2.74
m AHD		20.83	20.54	20.41	20.35	20.38	20.57	20.99	21.93	22.47	22.10	21.80	21.57	21.00	20.75	20.63	20.67	20.53	20.83
Purge	L	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only
pH																			
Temp	degrees C																		
Cond (EC)	uS/cm																		
Salinity	ppm																		
ROP mv (Field)																			
Alkalinity (Field)																			
TTA																			
Do %S																			
Comments																			
Al (filtered)	mg/L																		
Al(Total)	mg/L																		
As	mg/L																		
B	mg/L																		
Cd	mg/L																		
Ca	mg/L																		
Cr	mg/L																		
Co	mg/L																		
Cu	mg/L																		
Fe (Filtered)	mg/L																		
Fe (Total)	mg/L																		
Pb	mg/L																		
Mn	mg/L																		
Mg	mg/L																		
Mercury	mg/L																		
Molybdenum	mg/L																		
Ni	mg/L																		
Se	mg/L																		
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Zn	mg/L																		
Fl as F																			
CaCO3 (Acidity)	mg/L																		
CaCO3 (Alkalinity)	mg/L																		
Bicarbonate																			
Calcium																			
Carbonate																			
NH3-N	mg/L																		
Cl	mg/L																		
EC	uS/cm																		
O2	mg/L																		
P	mg/L																		
pH Lab																			
Potassium																			
Sodium																			
Sulphate	mg/L																		
TDS	mg/L																		
N	mg/L																		
Phos	mg/L																		

20005165		Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
Date		6/07/2021	10/08/2021	6/09/2021	14/10/2021	11/11/2021	14/12/2021	6/01/2022	3/02/2022	8/03/2022	19/04/2022	17/05/2022	23/06/2022	20/07/2022	25/08/2022	15/09/2022	20/10/2022	22/11/2022	13/12/2022
Casing Height above topo	m	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Depth of bore	m	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
SWL (m)	m (from top of casing)	2.38	0.65	0.94	1	1.33	1.9	2.5	2.72	2.96	2.98	2.85	2.5	2.2	0.94	0.8	0.79	1.21	1.72
m AHD		21.19	22.92	22.63	22.57	22.24	21.67	21.07	20.85	20.61	20.59	20.72	21.07	21.37	22.63	22.77	22.78	22.36	21.85
Purge	L	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only
pH																			
Temp	degrees C																		
Cond (EC)	uS/cm																		
Salinity	ppm																		
ROP mv (Field)																			
Alkalinity (Field)																			
TTA																			
Do %S																			
Comments																			
Al (filtered)	mg/L																		
Al(Total)	mg/L																		
As	mg/L																		
B	mg/L																		
Cd	mg/L																		
Ca	mg/L																		
Cr	mg/L																		
Co	mg/L																		
Cu	mg/L																		
Fe (Filtered)	mg/L																		
Fe (Total)	mg/L																		
Pb	mg/L																		
Mn	mg/L																		
Mg	mg/L																		
Mercury	mg/L																		
Molybdenum	mg/L																		
Ni	mg/L																		
Se	mg/L																		
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Zn	mg/L																		
Fl as F																			
CaCO3 (Acidity)	mg/L																		
CaCO3 (Alkalinity)	mg/L																		
Bicarbonate																			
Calcium																			
Carbonate																			
NH3-N	mg/L																		
Cl	mg/L																		
EC	uS/cm																		
O2	mg/L																		
P	mg/L																		
pH Lab																			
Potassium																			
Sodium																			
Sulphate	mg/L																		
TDS	mg/L																		
N	mg/L																		
Phos	mg/L																		

20005166. NOW OWNED BY JEREMY STEPHANI. 4.3M DEEP WELL-SUPERFICIAL---LOCATION south of rental house. Supplements house water,.
Well which feeds house.

20005166		Triggers	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17
Date							6/06/2017	29/06/2017	25/07/2017	15/08/2017	20/09/2017	17/10/2017	14/11/2017	15/12/2017
Casing Height above topo	m	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Depth of bore	m	4.30		4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30
Lead (Pb)														
SWL (m)	m (from top of casing)						2.7	2.57	2	0.83	1.12	1.22	2.14	2.35
m AHD							21.1	21.23	21.8	22.97	22.68	22.58	21.66	21.45
Purge	L													
Field pH		<5						6.2	6.34	6.29	6.25	6.31	6.55	6.2
Temp	degrees C							15.4	13.8	15.3	18.1	16.4	17.4	20
Field Cond (EC)	uS/cm	>1655.55						1750.00	1580.00	1440.00	1310.00	1500.00	1270.00	1220.00
Field Salinity	ppm							870	790	720	650	750	630	610
Field ROP	mv							105	95	111	203	160	196	181
Field Alkalinity		<6.99									87	135	126	114
Field TTA		>133.75									68	125	95	130
Field DO %S									17.5	21.5	18.7	14	20.7	17.9
Comments							dip only							
Aluminium Filtered (Al)	mg/L	>1						0.016	0.34	0.31	0.32	0.25	0.39	0.032
Aluminium Total (Al)	mg/L							0.067			0.36			0.061
Arsenic (As)	mg/L							0.0001			0.0002			0.0003
Arsenic (As) Total	mg/L													
Boron (B)	mg/L													
Cadmium (Cd)	mg/L							<0.0001			<0.0001			<0.0001
Cadmium (Cd) Total	mg/L													
Calcium (Ca)	mg/L													
Chromium (Cr)	mg/L							0.0001			0.0003			0.0001
Chromium (Cr) Total	mg/L													
Chromium VI (Cr)	mg/L													
Chromium VI (Cr) Total	mg/L													
Cobolt (Co)	mg/L													
Cobolt (Co) Total	mg/L													
Copper (Cu)	mg/L													
Copper (Cu) Total	mg/L													
Iron Filtered (Fe)	mg/L	>0.28						0.11	0.12	0.066	0.095	0.18	0.19	0.015
Iron Total (Fe)	mg/L							0.12			0.1			0.017
Lead (Pb)	mg/L													
Manganese (Mn)	mg/L	>0.4						0.0055	0.004	0.004	0.015	0.028	0.081	0.17
Magnesium (Mg)	mg/L								38.3	34.8		36.7	30.2	
Mercury (Hg)	mg/L													
Mercury (Hg) Total	mg/L													
Molybdenum (Mo)	mg/L													
Nickel (Ni)	mg/L							<0.0005			0.0011			0.0008
Nickel (Ni) Total	mg/L													
Selenium (Se)	mg/L							<0.0002			0.0004			0.0003
Selenium (Se) Total	mg/L													
Uranium (U	mg/L													
Uranium (U Total	mg/L													
Zinc (Zn)	mg/L							0.023			0.029			0.017
Zinc (Zn) Total	mg/L													
Thallium (Tl)	mg/L													
Thallium (Tl) Total	mg/L													
CaCO3 (Acidity)	mg/L							35	43	44	46	34	33	56
CaCO3 (Alkalinity)	mg/L							64	70	82	91	130	130	120
Bicarbonate	mg/L								70	82		130	130	
Calcium	mg/L								40.4	35.4		47.9	40.8	
Carbonate	mg/L								<1	<1		<1	<1	
Ammonia (NH3-N)	mg/L							<0.010			0.012			<0.010
Nitrogen Total (N)	mg/L							4.9			8.7			1.6
Chloride (Cl)	mg/L	>357.7						380	330	260	220	230	190	170
NATA EC	uS/cm							1730	1540	1360	1200	1320	1210	1080
O2	mg/L							5.1			3.1			4
Phosphate as PO4-P	mg/L							<0.005			0.017			<0.005
Phosphorus Total (P)	mg/L							<0.005			0.032			<0.005
NATA pH								6.6	6.6	6.6	6.6	6.7	6.8	6.6
Potassium (K)	mg/L								51.5	50.4		50.3	40.9	
Sodium (Na)	mg/L								170	114		109	118	
Sulphate (SO_4^{2-})	mg/L	>181.79						160	140	130	140	150	130	130
TDS	mg/L	>896.76						1000	870	710	650	660	670	570
Eh	mV													
Radium 226														
Radium 228														
Acrylamide														
Sulphate:Chloride Ratio		>0.84						0.42	0.42	0.50	0.64	0.65	0.68	0.76
Chloride:Sulphate Ratio		*						2.38	2.36	2.00	1.57	1.53	1.46	1.31

20005166	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
Date	15/01/2018	13/02/2018	13/03/2018	16/04/2018	9/05/2018	13/06/2018	11/07/2018	13/08/2018	11/09/2018	10/10/2018	12/11/2018	10/12/2018
Casing Height above topo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Depth of bore	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30
Lead (Pb)												
SWL (m)	2.37	2.53	2.74	2.93	2.93	2.2	1.5	0.72	0.79	1.18	1.59	2
m AHD	21.43	21.27	21.06	20.87	20.87	21.60	22.30	23.08	23.01	22.62	22.21	21.80
Purge												
Field pH	6.06	6.23	6.12	6.06	6.35	6.26			6.55			6.4
Temp	23.5	19.8	21.6	19	18	16.7			14.8			18.4
Field Cond (EC)	1230.00	1250.00	1190.00	1480.00	1390.00	1510.00			1250.00			1230.00
Field Salinity	610	630	600	740	700	750			620			610
Field ROP	172	200	252	238	227	300			175			181
Field Alkalinity	87	84	96	87	69	75			135			180
Field TTA	110	90	80	120	65	65			90			130
Field DO %S	10.7	14.5	17.7		23.6	23.2			24.2			27.1
Comments							Dip Only	Dip Only		Dip Only	Dip Only	
Aluminium Filtered (Al)	0.047	0.022	0.034	0.011	0.013	0.038			0.67			0.031
Aluminium Total (Al)			0.12			0.043						
Arsenic (As)			0.0001			0.0003						
Arsenic (As) Total												
Boron (B)												
Cadmium (Cd)			<0.0001			<0.0001						
Cadmium (Cd) Total												
Calcium (Ca)												
Chromium (Cr)			<0.0001			0.0002						
Chromium (Cr) Total												
Chromium VI (Cr)												
Chromium VI (Cr) Total												
Cobolt (Co)												
Cobolt (Co) Total												
Copper (Cu)												
Copper (Cu) Total												
Iron Filtered (Fe)	0.12	0.096	0.13	0.18	0.22	0.026			0.32			0.19
Iron Total (Fe)			0.016			0.033						
Lead (Pb)												
Manganese (Mn)	0.16	0.13	0.013	0.057	0.024	0.015			0.027			0.66
Magnesium (Mg)	21.6	29.8		32.1	28.7				27			29.9
Mercury (Hg)												
Mercury (Hg) Total												
Molybdenum (Mo)												
Nickel (Ni)			<0.0005			0.0007						
Nickel (Ni) Total												
Selenium (Se)			0.0002			0.0003						
Selenium (Se) Total												
Uranium (U												
Uranium (U Total												
Zinc (Zn)			0.027			0.17						
Zinc (Zn) Total												
Thallium (Tl)												
Thallium (Tl) Total												
CaCO3 (Acidity)	52	31	41	23	14	26			35			59
CaCO3 (Alkalinity)	78	77	57	76	66	94			140			200
Bicarbonate	78	77		76	66				140			200
Calcium	29	37.2		38.1	38.8				43.3			57.1
Carbonate												
Ammonia (NH3-N)			<0.010			<0.010						
Nitrogen Total (N)			11			4.3						
Chloride (Cl)	180	220	200	300	280	300			170			159
NATA EC	1040	1080	1110	1460	1350	1440			1120			1130
O2			5.2			5.7						
Phosphate as PO4-P			<0.005			<0.005						
Phosphorus Total (P)			<0.005			0.035						
NATA pH	6.3	6.6	6.3	6.7	6.7	6.9			6.8			6.7
Potassium (K)	37.5	51.9		44	46.7				42.3			47.4
Sodium (Na)	87.7	131		153	147				104			94.9
Sulphate (SO_4^{2-})	140	140	120	140	130	140			140			110
TDS	640	756	636	732	773	801			645			670
Eh												
Radium 226												
Radium 228												
Acrylamide												
Sulphate:Chloride Ratio	0.78	0.64	0.60	0.47	0.46	0.47	#DIV/0!	#DIV/0!	0.82	#DIV/0!	#DIV/0!	0.69
Chloride:Sulphate Ratio	1.29	1.57	1.67	2.14	2.15	2.14	#DIV/0!	#DIV/0!	1.21	#DIV/0!	#DIV/0!	1.45

20005166	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
Date	14/01/2019	11/02/2019	11/03/2019	10/04/2019	8/05/2019	12/06/2019	11/07/2019	9/08/2019	11/09/2019	9/10/2019	12/11/2019	9/12/2019
Casing Height above topo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Depth of bore	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30
Lead (Pb)												
SWL (m)	2.54	2.7	2.92	3.07	2.99	2.87	2.02	1.83	1.61	1.82	2.02	2.32
m AHD	21.26	21.10	20.88	20.73	20.81	20.93	21.78	21.97	22.19	21.98	21.78	21.48
Purge												
Field pH			6.21			7.02			6.51			6.84
Temp			20.3			13			16.8			20.5
Field Cond (EC)			1350.00			1310.00			1400.00			1500.00
Field Salinity			670			660			700			750
Field ROP			211			192			238			240
Field Alkalinity			69			66			102			66
Field TTA			70			25			90			20
Field DO %S			26.8			23.2			30.3			34.7
Comments	Dip Only	Dip Only		Dip Only	Dip Only		Dip Only	Dip Only		Dip Only	Dip Only	
Aluminium Filtered (Al)			0.035			0.04			0.016			<0.005
Aluminium Total (Al)						0.22						
Arsenic (As)						0.0001						
Arsenic (As) Total												
Boron (B)												
Cadmium (Cd)						<0.0001						
Cadmium (Cd) Total												
Calcium (Ca)												
Chromium (Cr)						0.0002						
Chromium (Cr) Total												
Chromium VI (Cr)												
Chromium VI (Cr) Total												
Cobolt (Co)												
Cobolt (Co) Total												
Copper (Cu)												
Copper (Cu) Total												
Iron Filtered (Fe)			0.32			0.25			0.14			0.18
Iron Total (Fe)						0.39						
Lead (Pb)												
Manganese (Mn)			0.046			0.011			0.16			0.034
Magnesium (Mg)			28.6						29.9			32
Mercury (Hg)												
Mercury (Hg) Total												
Molybdenum (Mo)												
Nickel (Ni)						0.0011						
Nickel (Ni) Total												
Selenium (Se)						<0.0002						
Selenium (Se) Total												
Uranium (U												
Uranium (U Total												
Zinc (Zn)						0.004						
Zinc (Zn) Total												
Thallium (Tl)												
Thallium (Tl) Total												
CaCO3 (Acidity)			24			6			20			10
CaCO3 (Alkalinity)			67			61			120			63
Bicarbonate			67						120			63
Calcium			34.9						48.6			23.7
Carbonate												
Ammonia (NH3-N)						0.3						
Nitrogen Total (N)						2.3						
Chloride (Cl)			248			301			232			308
NATA EC			1190			1250			1260			1330
O2						7.8						
Phosphate as PO4-P												
Phosphorus Total (P)						0.032						
NATA pH			6.8			7.1			7			7.3
Potassium (K)			45.6						45.1			21.7
Sodium (Na)			139						126			163
Sulphate (SO_4^{2-})			140			65			110			96
TDS			670			710			650			710
Eh												
Radium 226												
Radium 228												
Acrylamide												
Sulphate:Chloride Ratio	#DIV/0!	#DIV/0!	0.56	#DIV/0!	#DIV/0!	0.22	#DIV/0!	#DIV/0!	0.47	#DIV/0!	#DIV/0!	0.31
Chloride:Sulphate Ratio	#DIV/0!	#DIV/0!	1.77	#DIV/0!	#DIV/0!	4.63	#DIV/0!	#DIV/0!	2.11	#DIV/0!	#DIV/0!	3.21

20005166	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Date	9/01/2020	10/02/2020	11/03/2020	9/04/2020	11/05/2020	10/06/2020	10/07/2020	7/08/2020	8/09/2020	14/10/2020	10/11/2020	9/12/2020
Casing Height above topo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Depth of bore	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30
Lead (Pb)												
SWL (m)	2.6	2.79	2.99	3.04	2.91	2.7	2.27	1.55	1.28	1.54	1.83	1.97
m AHD	21.20	21.01	20.81	20.76	20.89	21.10	21.53	22.25	22.52	22.26	21.97	21.83
Purge												
Field pH			6.85			6.97			7.13			7.03
Temp			23			13.7			13.6			21.6
Field Cond (EC)			1080.00			1050.00			1020.00			1050.00
Field Salinity			540			520			510			520
Field ROP			304			290			344			364
Field Alkalinity			45			51			48			45
Field TTA			20			20			13			15
Field DO %S			24.8			35.1			34.4			
Comments	Dip Only	Dip Only		Dip Only	Dip Only		Dip Only	Dip Only		Dip Only	Dip Only	
Aluminium Filtered (Al)			<0.005			<0.005			<0.005			<0.005
Aluminium Total (Al)						0.009						
Arsenic (As)						<0.0001						
Arsenic (As) Total												
Boron (B)												
Cadmium (Cd)						<0.0001						
Cadmium (Cd) Total												
Calcium (Ca)												
Chromium (Cr)						<0.0001						
Chromium (Cr) Total												
Chromium VI (Cr)												
Chromium VI (Cr) Total												
Cobolt (Co)												
Cobolt (Co) Total												
Copper (Cu)												
Copper (Cu) Total												
Iron Filtered (Fe)			0.096			<0.005			0.11			0.18
Iron Total (Fe)						0.04						
Lead (Pb)												
Manganese (Mn)			0.004			<0.001			0.005			0.008
Magnesium (Mg)			22.2						23.4			29.5
Mercury (Hg)												
Mercury (Hg) Total												
Molybdenum (Mo)												
Nickel (Ni)						0.0015						
Nickel (Ni) Total												
Selenium (Se)						<0.0002						
Selenium (Se) Total												
Uranium (U												
Uranium (U Total												
Zinc (Zn)						0.052						
Zinc (Zn) Total												
Thallium (Tl)												
Thallium (Tl) Total												
CaCO3 (Acidity)			5			4			5			3
CaCO3 (Alkalinity)			41			40			41			48
Bicarbonate			41						41			48
Calcium			4.6						5.1			5.8
Carbonate												
Ammonia (NH3-N)						<0.010						
Nitrogen Total (N)						<0.025						
Chloride (Cl)			293			280			272			278
NATA EC			1070			1020			995			1020
O2						9.7						
Phosphate as PO4-P												
Phosphorus Total (P)						<0.005						
NATA pH			7.4			7.6			7.2			7.9
Potassium (K)			6.7						7.2			7
Sodium (Na)			142						149			146
Sulphate (SO_4^{2-})			34			32			32			37
TDS			530			610			520			540
Eh												
Radium 226												
Radium 228												
Acrylamide												
Sulphate:Chloride Ratio	#DIV/0!	#DIV/0!	0.12	#DIV/0!	#DIV/0!	0.11	#DIV/0!	#DIV/0!	0.12	#DIV/0!	#DIV/0!	0.13
Chloride:Sulphate Ratio	#DIV/0!	#DIV/0!	8.62	#DIV/0!	#DIV/0!	8.75	#DIV/0!	#DIV/0!	8.50	#DIV/0!	#DIV/0!	7.51

20005166	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
Date	15/01/2021	10/02/2021	15/03/2021	1/04/2021	5/05/2021	14/06/2021	6/07/2021	3/08/2021	7/09/2021	15/10/2021	1/11/2021	7/12/2021
Casing Height above topo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Depth of bore	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30
Lead (Pb)												
SWL (m)	2.43	2.47	2.41	2.8	2.7	2.35	2.02	1.96	0.99	1.18	1.22	1.8
m AHD	21.37	21.33	21.39	21	21.1	21.45	21.78	21.84	22.81	22.62	22.58	22.00
Purge												
Field pH			6.54			7.12			6.77			6.69
Temp			20.1			14.2			15.3			19.7
Field Cond (EC)			1080.00			1130.00			1210.00			670.00
Field Salinity			540			560			610			330
Field ROP			368			381			330			409
Field Alkalinity			35			54			81			66
Field TTA			14			20			54			33
Field DO %S			23.1									
Comments	Dip Only	Dip Only		Dip Only	Dip Only		Dip Only	Dip Only		Dip Only	Dip Only	
Aluminium Filtered (Al)			<0.005			<0.005			0.083			0.12
Aluminium Total (Al)												
Arsenic (As)												
Arsenic (As) Total												
Boron (B)												
Cadmium (Cd)												
Cadmium (Cd) Total												
Calcium (Ca)												27.4
Chromium (Cr)												
Chromium (Cr) Total												
Chromium VI (Cr)												
Chromium VI (Cr) Total												
Cobolt (Co)												
Cobolt (Co) Total												
Copper (Cu)												
Copper (Cu) Total												
Iron Filtered (Fe)			0.24			0.18			0.2			0.2
Iron Total (Fe)												
Lead (Pb)												
Manganese (Mn)			0.013			0.008			0.74			0.05
Magnesium (Mg)			25.5									10.6
Mercury (Hg)												
Mercury (Hg) Total												
Molybdenum (Mo)												
Nickel (Ni)												
Nickel (Ni) Total												
Selenium (Se)												
Selenium (Se) Total												
Uranium (U												
Uranium (U Total												
Zinc (Zn)												
Zinc (Zn) Total												
Thallium (Tl)												
Thallium (Tl) Total												
CaCO3 (Acidity)			11			8			34			35
CaCO3 (Alkalinity)			41			39			120			75
Bicarbonate			41									75
Calcium			5.4									
Carbonate												
Ammonia (NH3-N)												
Nitrogen Total (N)												
Chloride (Cl)			283			278			222			85
NATA EC			1070			1030			1160			577
O2												
Phosphate as PO4-P												
Phosphorus Total (P)												
NATA pH			7.2			7.2			6.9			6.9
Potassium (K)			8.1									32
Sodium (Na)			157			144			113			50.3
Sulphate (SO_4^{2-})			33			32			96			55
TDS			560			550			650			320
Eh												
Radium 226												
Radium 228												
Acrylamide												
Sulphate:Chloride Ratio	#DIV/0!	#DIV/0!	0.12	#DIV/0!	#DIV/0!	0.12	#DIV/0!	#DIV/0!	0.43	#DIV/0!	#DIV/0!	0.65
Chloride:Sulphate Ratio	#DIV/0!	#DIV/0!	8.58	#DIV/0!	#DIV/0!	8.69	#DIV/0!	#DIV/0!	2.31	#DIV/0!	#DIV/0!	1.55

20005166	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
Date	6/01/2022	3/02/2022	10/03/2022	7/04/2022	12/05/2022	5/07/2022	9/08/2022	30/08/2022	28/09/2022	20/10/2022	22/11/2022	15/12/2022
Casing Height above topo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Depth of bore	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30
Lead (Pb)												
SWL (m)	2.14	2.52	2.77	2.78	2.97	2.4	2.22	2	1.65	1.6	1.72	2.23
m AHD	21.66	21.28	21.03	21.02	20.83	21.40	21.58	21.80	22.15	22.20	22.08	21.57
Purge												
Field pH			6.51			6.92			6.91			6.51
Temp			23.2			14.5			16.2			19.4
Field Cond (EC)			1290.00			1610.00			870.00			1090.00
Field Salinity			650			820			440			550
Field ROP			363			293			321			280
Field Alkalinity			105			120			85			65
Field TTA			70			90			35			40
Field DO %S												
Comments	Dip Only	Dip Only		Dip Only	Dip Only		Dip Only	Dip Only		Dip Only	Dip Only	
Aluminium Filtered (Al)			0.037			<0.005			0.28			0.031
Aluminium Total (Al)						0.13			4.3			0.69
Arsenic (As)						0.0002			0.0003			0.0008
Arsenic (As) Total						0.0005			0.0005			0.0009
Boron (B)												
Cadmium (Cd)						<0.0001			<0.0001			<0.0001
Cadmium (Cd) Total						0.0002			<0.0001			<0.0001
Calcium (Ca)			41.7			69.4			34.8			31.8
Chromium (Cr)						0.0001			0.0006			0.0006
Chromium (Cr) Total						0.023			0.004			<0.004
Chromium VI (Cr)						<0.004			<0.004			<0.004
Chromium VI (Cr) Total						<0.004			<0.004			<0.04
Cobolt (Co)						0.0003			0.0002			0.0009
Cobolt (Co) Total						0.0004			0.0003			0.0012
Copper (Cu)						0.0027			0.015			0.0028
Copper (Cu) Total						0.0028			0.019			0.0067
Iron Filtered (Fe)			0.095			0.007			0.28			1.1
Iron Total (Fe)						2.5			0.86			1.7
Lead (Pb)						0.0001			0.0006			0.0001
Manganese (Mn)			0.49			0.67			0.049			0.53
Magnesium (Mg)			18.4			29.8			15.2			13.6
Mercury (Hg)						<0.00005			<0.00005			<0.00005
Mercury (Hg) Total						<0.00005			<0.00005			<0.00005
Molybdenum (Mo)												
Nickel (Ni)						0.0007			0.0017			0.0014
Nickel (Ni) Total						<0.0005			0.0026			0.0014
Selenium (Se)						0.0002			0.0002			<0.0002
Selenium (Se) Total						0.002			0.0004			0.0002
Uranium (U						0.0003			0.0002			<0.0001
Uranium (U Total						0.003			0.0004			0.0001
Zinc (Zn)						0.018			0.069			0.031
Zinc (Zn) Total						0.02			0.073			0.076
Thallium (Tl)						<0.0001			<0.0001			<0.0001
Thallium (Tl) Total						0.0002			<0.0001			<0.0001
CaCO3 (Acidity)			33			30			14			10
CaCO3 (Alkalinity)			85			180			74			50
Bicarbonate			85			180			74			50
Calcium												
Carbonate												
Ammonia (NH3-N)												
Nitrogen Total (N)												
Chloride (Cl)			204			256			149			267
NATA EC			1040			1340			745			1050
O2												
Phosphate as PO4-P												
Phosphorus Total (P)												
NATA pH			7.1			7.2			6.9			6.9
Potassium (K)			39.9			46.8			27.4			19.8
Sodium (Na)			100			141			83.5			128
Sulphate (SO_4^{2-})			79			88			50			43
TDS			540			660			400			570
Eh						336			304			564
Radium 226						0.03			<0.01			0.03
Radium 228						<0.08			<0.08			<0.08
Acrylamide												
Sulphate:Chloride Ratio	#DIV/0!	#DIV/0!	0.39	#DIV/0!	#DIV/0!	0.34	#DIV/0!	#DIV/0!	0.34	#DIV/0!	#DIV/0!	0.16
Chloride:Sulphate Ratio	#DIV/0!	#DIV/0!	2.58	#DIV/0!	#DIV/0!	2.91	#DIV/0!	#DIV/0!	2.98	#DIV/0!	#DIV/0!	6.21

LOT 229 PHILIPS. WINDMILL ~65M SOUTH OF PRINCEFIELD RD. SUPEFICIAL @ 3.6M (SLUDGE). 0.1M OF CONC LID
In well with cover

20005169		Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
Date						1/06/2017	27/06/2017	25/07/2017	15/08/2017	19/09/2017	17/10/2017	14/11/2017	13/12/2017	11/01/218	12/02/2018	12/03/2018	12/04/2018	8/05/2018	12/06/2018	10/07/2018	9/08/2018	10/09/2018	11/10/2018	8/11/2018	11/12/2018
Casing Height above topo	m	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Depth of bore	m	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80
SWL (m)	m (from top of casing)					2.2	1.98	1.29	0.23	1.08	1.07	1.44	1.69	1.87	1.92	2.09	2.42	2.53	1.3	0.72		0.69	1.01	1.5	1.79
m AHD						16.09	16.31	17.00	18.06	17.21	17.22	16.85	16.60	16.42	16.37	16.20	15.87	15.76	16.99	17.57		17.60	17.28	16.79	16.50
Purge	L																								
pH																									
Temp	degrees C																								
Cond (EC)	uS/cm																								
Salinity	ppm																								
ROP mv (Field)																									
Alkalinity (Field)																									
TTA																									
Do %S																									
Comments						Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	No Access	No Access	Dip Only	Dip Only	Dip Only
Al (filtered)	mg/L																								
Al(Total)	mg/L																								
As	mg/L																								
B	mg/L																								
Cd	mg/L																								
Ca	mg/L																								
Cr	mg/L																								
Co	mg/L																								
Cu	mg/L																								
Fe (Filtered)	mg/L																								
Fe (Total)	mg/L																								
Pb	mg/L																								
Mn	mg/L																								
Mg	mg/L																								
Mercury	mg/L																								
Molybdenum	mg/L																								
Ni	mg/L																								
Se	mg/L																								
U	mg/L																								
Zn	mg/L																								
Fl as F																									
CaCO3 (Acidity)	mg/L																								
CaCO3 (Alkalinity)	mg/L																								
Bicarbonate																									
Calcium																									
Carbonate																									
NH3-N	mg/L																								
Cl	mg/L																								
EC	uS/cm																								
O2	mg/L																								
P	mg/L																								
pH Lab																									
Potassium																									
Sodium																									
Sulphate	mg/L																								
TDS	mg/L																								
N	mg/L																								
Phos	mg/L																								

20005169		Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Date		14/01/2019	11/02/2019	13/03/2019	10/04/2019	9/05/2019	13/06/2019	11/07/2019	14/08/2019	12/09/2019	10/10/2019	12/11/2019	12/12/2019	14/01/2020	13/02/2020	13/03/2020	9/04/2020	11/05/2020	9/06/2020	13/07/2020	6/08/2020	9/09/2020	14/10/2020	10/11/2020	8/12/2020
Casing Height above topo	m	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Depth of bore	m	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80
SWL (m)	m (from top of casing)	2.07		2.51	2.65	2.72	2.17	1	1.13	0.99	1.26	1.58	1.88	2.21	2.54	2.7	2.94	2.42	2.06	1.33	0.88	0.58	1.15	1.4	1.56
m AHD		16.22		15.78	15.64	15.57	16.12	17.29	17.16	17.30	17.03	16.71	16.41	16.08	15.75	15.59	15.35	15.87	16.23	16.96	17.41	17.71	17.14	16.89	16.73
Comments		Dip Only	No Access	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only

20005169		Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
Date		12/01/2021	10/02/2021	11/03/2021	1/04/2021	12/05/2021	9/06/2021	7/07/2021	9/09/2021	16/09/2021	19/10/2021	11/11/2021	15/12/2021	11/01/2022	8/02/2022	2/03/2022	5/04/2022	17/05/2022	22/06/2022	19/07/2022	31/08/2022	20/09/2022	19/10/2022	16/11/2022	14/12/2022
Casing Height above topo	m	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Depth of bore	m	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80
SWL (m)	m (from top of casing)	1.93	2.4	2.36	2.99	2.13	1.62	1.13	0.34	0.73	1.2	1.4	1.67	1.94	2.34	2.55	2.55	2.61	1.94	1.63	0.88	0.9	1.24	1.56	1.8
m AHD		16.36	15.89	15.93	15.30	16.16	16.67	17.16	17.95	17.56	17.09	16.89	16.62	16.35	15.95	15.74	15.74	15.68	16.35	16.66	17.41	17.39	17.05	16.73	16.49
Comments		Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only

20005253. LOT1426 SOUTH. ~3.4M DEEP.UNKNOWN AGE. no windmill- sheet of mesh above well to keep animals out.

Bashfords well down lane way backfilled with sediment to 2.6m total

20005253		Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17
Date						31/05/2017	29/06/2017	26/07/2017	16/08/2017	20/09/2017	18/10/2017	15/11/2017	18/12/2017
Casing Height above topo	m	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Depth of bore	m	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40
SWL (m)	m (from top of casing)					1.2	1.3	0.68	0.15	0.47	0.93	1.17	1.26
m AHD						29.40	29.30	29.92	30.45	30.13	29.67	29.43	29.34
Purge	L					Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only
pH													
Temp	degrees C												
Cond (EC)	uS/cm												
Salinity	ppm												
ROP mv (Field)													
Alkalinity (Field)													
TTA													
Do %S													
Comments													
Al (filtered)	mg/L												
Al(Total)	mg/L												
As	mg/L												
B	mg/L												
Cd	mg/L												
Ca	mg/L												
Cr	mg/L												
Co	mg/L												
Cu	mg/L												
Fe (Filtered)	mg/L												
Fe (Total)	mg/L												
Pb	mg/L												
Mn	mg/L												
Mg	mg/L												
Mercury	mg/L												
Molybdenum	mg/L												
Ni	mg/L												
Se	mg/L												
U	mg/L												
Zn	mg/L												
Fl as F													
CaCO3 (Acidity)	mg/L												
CaCO3 (Alkalinity)	mg/L												
Bicarbonate													
Calcium													
Carbonate													
NH3-N	mg/L												
Cl	mg/L												
EC	uS/cm												
O2	mg/L												
P	mg/L												
pH Lab													
Potassium													
Sodium													
Sulphate	mg/L												
TDS	mg/L												
N	mg/L												
Phos	mg/L												

20005253		Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
Date		16/01/2018	14/02/2018	14/03/2018	17/04/2018	10/05/2018	14/06/2018	11/07/2018	13/08/2018	12/09/2018	10/10/2018	12/11/2018	11/12/2018
Casing Height above topo	m	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Depth of bore	m	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40
SWL (m)	m (from top of casing)	1.31	1.33	1.39	1.46	1.48	0.37	0.44	0.19	0.43	0.94	1.27	1.49
m AHD		29.29	29.27	29.21	29.14	29.12	30.23	30.16	30.41	30.17	29.66	29.33	29.11
Purge	L	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only

20005253		Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
Date		14/01/2019	11/02/2019	14/03/2019	10/04/2019	8/05/2019	11/06/2019	12/07/2019	9/08/2019	10/09/2019	9/10/2019	12/11/2019	11/12/2019
Casing Height above topo	m	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Depth of bore	m	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40
SWL (m)	m (from top of casing)	1.61	1.63	1.61	1.64	1.65	1.19	0.43	0.66	0.62	0.95	1.2	1.47
m AHD		28.99	28.97	28.99	28.96	28.95	29.41	30.17	29.94	29.98	29.65	29.40	29.13
Purge	L	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only

20005253		Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Date		13/01/2020	10/02/2020	10/03/2020	9/04/2020	11/05/2020	10/06/2020	10/07/2020	7/08/2020	10/09/2020	14/10/2020	10/11/2020	10/12/2020
Casing Height above topo	m	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Depth of bore	m	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40
SWL (m)	m (from top of casing)	1.48	1.5	1.56	1.67	1.29	1.11	0.45	0.5	0.14	0.94	0.96	1.2
m AHD		29.12	29.10	29.04	28.93	29.31	29.49	30.15	30.10	30.46	29.66	29.64	29.40
Purge	L	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only

20005253		Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
Date		15/01/2021	10/02/2021	17/03/2021	1/04/2021	5/05/2021	10/06/2021	8/07/2021	10/08/2021	6/09/2021	12/10/2021	1/11/2021	8/12/2021
Casing Height above topo	m	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Depth of bore	m	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40
SWL (m)	m (from top of casing)	1.4	1.31	1.46	1.55	1.12	0.58	0.30		0.39	0.65	0.87	1.18
m AHD		29.20	29.29	29.14	29.05	29.48	30.02	30.30		30.21	29.95	29.73	29.42
Purge	L	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only		Dip only	Dip only	Dip only	Dip only

20005253		Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
Date		6/01/2022	9/02/2022	3/03/2022	19/04/2022	12/05/2022	30/06/2022	26/07/2022	19/07/2022	14/09/2022	20/10/2022	22/11/2022	30/11/2022
Casing Height above topo	m	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Depth of bore	m	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40	3.40
SWL (m)	m (from top of casing)	1.38	1.53	1.56	1.6	1.62	1.2	1.1	0.9	0.7	0.62	0.8	1.32
m AHD		29.22	29.07	29.04	29.00	28.98	29.40	29.50	29.70	29.90	29.98	29.80	29.28
Purge	L	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only

DOW steel casing at natural surface level. 500mm PVC casing.

SCPD28A		Triggers	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
Date							31/05/2017	27/06/2017	25/07/2017	17/07/2017	19/09/2017	17/10/2017	13/11/2017	13/12/2017	11/01/2018	12/02/2018	12/03/2018	12/04/2018	8/05/2018	12/06/2018	10/07/2018	9/08/2018	12/09/2018	11/10/2018	8/11/2018	11/12/2018
Casing Height above topo	m	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Depth of bore	m	9.00		9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00
SWL (m)	m (from top of casing)						1.5	1.3	0.73	0.17	0.94	0.69	1.16	1.36	1.45	1.44	1.55	1.62	1.6	0.42	0.31	0	0.39	0.9	1.14	1.34
m AHD							19.7	19.9	20.47	21.03	20.26	20.51	20.04	19.84	19.75	19.76	19.65	19.58	19.60	20.78	20.89	21.20	20.81	20.30	20.06	19.86
Purge	L							83	90	98	87	90	85	82	82	81	80	79	80	94	95	99	94	88	85	83
Field pH		<5						6.25	6.06	6.14	5.92	5.93	6.23	5.88	5.97	5.9	5.85	5.98	5.91	6	5.8	6.25	6.19	5.84	5.76	5.65
Temp	degrees C							15.2	15.6	18.7	17.1	16.1	19.8	19.9	19.2	22.6	21.3	19.5	18.9	17.9	16.9	15.2	15.3	17.1	20.2	15.9
Field Cond (EC)	uS/cm	>4205.06						3250.00	3490.00	3230.00	2980.00	3670.00	3700.00	3750.00	3810.00	3720.00	3540.00	3620.00	3510.00	3690.00	3560.00	2790.00	2760.00	3540.00	3640.00	3720.00
Field Salinity	ppm							1630	1750	1620	1490	1840	1850	1880	1910	1860	1770	1810	1760	1850	1780	1390	1380	1770	1820	1860
Field ROP	mv							49	166	87	292	198	242	260	212	284	275	285	285	301	405	381	192	275	268	301
Field Alkalinity		<42.48										75	87	66	90	72	96	63	48	60	87	81	87	60	60	60
Field TTA		>137.34										121	100	125	128	100	135	100	120	95	100	50	80	90	80	100
Field DO %S									17.2	15.2	12.5	14.7	11	9.9	8.5	10.4	8.5		16.2	14.5	15	14.6	14.6	12.5	14.5	17.7
Comments																										
Aluminium Filtered (Al)	mg/L	>1						0.48	0.028	0.24	0.14	0.35	0.031	0.04	0.031	0.11	0.031	0.008	0.026	0.013	0.037	0.05	0.054	0.016	0.048	0.023
Aluminium Total (Al)	mg/L							68			5.8			0.41			8.3			1.7						
Arsenic (As)	mg/L							0.0009			0.0006			0.0003			0.0006			0.0004						
Arsenic (As) Total	mg/L																									
Boron (B)	mg/L																									
Cadmium (Cd)	mg/L							<0.0001			<0.0001			<0.0001			<0.0001			<0.0001						
Cadmium (Cd) Total	mg/L																									
Calcium (Ca)	mg/L																									
Chromium VI (Cr)	mg/L																									
Chromium VI (Cr) Total	mg/L																									
Chromium (Cr)	mg/L							0.0007			0.0015			0.0002			0.0003			0.0002						
Chromium Total (Cr)	mg/L																									
Cobalt (Co)	mg/L																									
Cobalt (Co) Total	mg/L																									
Copper (Cu)	mg/L																									
Copper (Cu) Total	mg/L																									
Iron Filtered (Fe)	mg/L	>3.18						0.41	0.66	0.46	1.3	2.8	0.73	1.1	1.7	2.3	2.6	1.6	1.8	1.2	1.2	0.43	0.57	0.54	0.88	0.86
Iron Total (Fe)	mg/L							52			8.9			2			7.3			6.4						
Lead (Pb)	mg/L																									
Manganese (Mn)	mg/L	>0.28						0.14	0.065	0.035	0.076	0.067	0.079	0.09	0.064	0.056	0.063	0.049	0.047	0.055	0.07	0.18	0.25	0.12	0.093	0.073
Magnesium (Mg)	mg/L								65.9	36.3		64.6	70.4		65.3	63.8		57.7	65.2		62.7	51.1	51	70.4	67	68.5
Mercury (Hg)	mg/L																									
Mercury (Hg) Total	mg/L																									
Molybdenum (Mo)	mg/L																									
Nickel (Ni)	mg/L							0.003			0.011			0.016			0.0024			0.0031						
Nickel (Ni) Total	mg/L																									
Selenium (Se)	mg/L							<0.0002			<0.0002			<0.0002			<0.0002			<0.0002						
Selenium (Se) Total	mg/L																									
Uranium (U	mg/L																									
Uranium (U Total	mg/L																									
Zinc (Zn)	mg/L							0.72			1.4			0.28			0.15			0.24						
Zinc (Zn) Total	mg/L																									
Thallium (Tl)	mg/L																									
Thallium (Tl) Total	mg/L																									
CaCO3 (Acidity)	mg/L							57	79	52	46	40	49	60	85	56	82	57	44	53	68	65	67	81	88	53
CaCO3 (Alkalinity)	mg/L							90	63	76	110	64	48	55	59	53	61	57	57	52	63	80	97	60	58	56
Bicarbonate	mg/L								63	76		64	48		59	53		57	57		63	80	97	60	58	56
Calcium	mg/L								12.2	8.9		16	13.1		10.9	13.1		10.1	10.7		16.5	18.9	23.6	16.1	13.3	12.3
Carbonate	mg/L								<1	<1		<1	<1													
Ammonia (NH3-N)	mg/L							0.07			0.026			0.086			0.38			0.012						
Nitrogen Total (N)	mg/L							2.5			1.4			0.5			0.8			0.58						
Chloride (Cl)	mg/L	>1258.72						940	1000	920	520	1000	1100	1100	1100	1100	900	1100	1000	1100	1000	780	700	1020	1060	1070
NATA EC	uS/cm							3160	3450	3160	1920	3390	3570	3580	3460	3580	3440	3480	3540	3580	3280	2560	2510	3450	3560	3480
O2	mg/L							5.5			6			3.7			2.6			10						
Phosphate as PO4-P	mg/L							<0.005			0.006			<0.005			0.006			0.008						
Phosphorus Total (P)	mg/L							0.42			0.07			0.065			0.11			0.14						
NATA pH								6.6	6.3	6.4	6.7	6.3	6.3	6.1	6.1	6.1	6.1	6.2	6.2	6.1	6.1	6.3	6.4	6.2	6.1	6.3
Potassium (K)	mg/L								4.4	2.9		4.6	4.3		3.8	4.2		3.4	4.2		4.6	5.6	6.2	4.9	4.4	4.8
Sodium (Na)	mg/L								572	187		205	572		536	607		523	559		503	423	413	563	558	607
Sulphate (SO_4^{2-})	mg/L	>1258.72						120	130	120	75	120	120	140	140	140	130	130	140	130	120	98	99	120	130	120
TDS	mg/L	>4078.27						1800	1900	1700	960	1700	1900	1800	2010	1860	1810	1760	1730	1960	1830	1390	1270	1900	2000	1700
Radium 226																										
Radium 228																										
Acrylamide																										
Eh	mV																									
Sulphate:Chloride Ratio		>0.5						0.13	0.13	0.13	0.14	0.12	0.11	0.13	0.13	0.13	0.14	0.12	0.14	0.12	0.12	0.13	0.14	0.12	0.12	0.11
Chloride:Sulphate Ratio		<2.0						7.83	7.69	7.67	6.93	8.33	9.17	7.86	7.86	7.86	6.92	8.46	7.14	8.46	8.33	7.96	7.07	8.50	8.15	8.92

SCPD28A	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Date	14/01/2019	7/02/2019	12/03/2019	9/04/2019	9/05/2019	11/06/2019	9/07/2019	12/08/2019	9/09/2019	8/10/2019	7/11/2019	10/12/2019	9/01/2020	11/02/2020	10/03/2020	8/04/2020	7/05/2020	9/06/2020	8/07/2020	6/08/2020	7/09/2020	12/10/2020	5/11/2020	7/12/2020
Casing Height above topo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Depth of bore	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00
SWL (m)	1.49	1.55	1.55	1.67	1.65	1.31	0.29	0.69	0.45	0.79	1.1	1.37	1.5	1.6	1.69	1.56	2.14	1.24	0.59	0.48	0	0.81	1.07	1.18
m AHD	19.71	19.65	19.65	19.53	19.55	19.89	20.91	20.51	20.75	20.41	20.10	19.83	19.70	19.60	19.51	19.64	19.06	19.96	20.61	20.72	21.20	20.39	20.13	20.02
Purge	81	80	80	79	79	83	95	90	93	89	86	82	40	40	39	40	37	42	46	47	49	45	43	42
Field pH	5.78	5.78	5.78	5.74	5.96	6.1	6.03	6.2	6.58	6.23	6.1	5.99	5.95	5.97	5.72	5.84	5.93	6.19	6.08	6.1	6.44	6.28	6.13	6.05
Temp	18.4	23.1	21.7	21.1	14.1	15.3	16.1	15.3	20.4	19	20.8	21	20.4	21.3	21.9	26.3	18.6	19.8	16.9	15.2	18.6	18.8	20.5	20.5
Field Cond (EC)	3660.00	3650.00	3780.00	3860.00	3610.00	3550.00	3420.00	2990.00	1610.00	3280.00	3620.00	3800.00	3480.00	3510.00	3450.00	3310.00	3470.00	3330.00	3350.00	3130.00	2060.00	2450.00	3440.00	3470.00
Field Salinity	1830	1820	1890	1930	1810	1780	1910	1500	800	1640	1810	1900	1740	1760	1780	1660	1730	1660	1680	1560	1030	1230	1720	1730
Field ROP	331	301	281	296	288	294	312	345	295	300	304	337	376	419	392	431	415	363	398	397	403	354	436	410
Field Alkalinity	78	66	63	60	66	75	72	72	90	80	85	66	54	66	69	75	69	66	69	60	75	120	93	87
Field TTA	85	90	105	100	100	85	100	85	45	75	72	70	80	100	120	145	155	100	100	90	70	110	100	90
Field DO %S	16.8	14.1	14.9	19.4	16.7	17.7	18.6	19.2	19.4	19.3	19.4	16.9	21.7	15.3	13	13.4	13.8	23.6	19.9	20.3	18.1	14.8	16.8	17.6
Comments																								
Aluminium Filtered (Al)	0.032	0.009	0.006	0.009	0.019	0.008	0.011	0.035	0.12	0.044	0.037	0.033	0.022	0.027	0.02	0.022	0.049	0.018	0.028	0.04	0.067	0.13	0.041	0.025
Aluminium Total (Al)						4.9												5.4						
Arsenic (As)						0.0005												0.0006						
Arsenic (As) Total																								
Boron (B)																								
Cadmium (Cd)						<0.0001												<0.0001						
Cadmium (Cd) Total																								
Calcium (Ca)																								
Chromium VI (Cr)																								
Chromium VI (Cr) Total																								
Chromium (Cr)						0.0001												0.0003						
Chromium Total (Cr)																								
Cobalt (Co)																								
Cobalt (Co) Total																								
Copper (Cu)																								
Copper (Cu) Total																								
Iron Filtered (Fe)	1.4	0.99	0.68	0.42	0.34	1.7	0.73	0.6	1.4	2.1	2.3	2.4	2.7	2	1.8	0.18	2.600	2	1.7	0.44	1.2	2.5	3.9	2.8
Iron Total (Fe)						6.4												7.1						
Lead (Pb)																								
Manganese (Mn)	0.072	0.056	0.057	0.041	0.061	0.05	0.038	0.056	0.66	0.24	0.11	0.087	0.07	0.069	0.079	0.04	0.047	0.063	0.051	0.042	0.17	0.29	0.13	0.099
Magnesium (Mg)	65.7	70.5	70.1	57.4	71		61	47.2	24.9	49.1	61.1	59.4	70.3	63.3	59.8	59.1	56.8		66.1	56.5	30.8	34.3	60.7	62
Mercury (Hg)																								
Mercury (Hg) Total																								
Molybdenum (Mo)																								
Nickel (Ni)						0.0014												0.0015						
Nickel (Ni) Total																								
Selenium (Se)						<0.0002												<0.0002						
Selenium (Se) Total																								
Uranium (U																								
Uranium (U Total																								
Zinc (Zn)						0.1												0.2						
Zinc (Zn) Total																								
Thallium (Tl)																								
Thallium (Tl) Total																								
CaCO3 (Acidity)	86	58	39	84	66	73	58	47	29	100	63	60	78	78	76	61	60	61	75	47	41	50	63	66
CaCO3 (Alkalinity)	54	53	53	54	54	53	60	67	85	77	65	59	59	60	57	64	59	55	60	62	110	110	71	65
Bicarbonate	54	53	53	54	54		60	67	85	77	64	59	59	60	57	64	59		60	62	110	110	71	65
Calcium	12.6	12.4	12.6	10.5	13.1		10.6	45.3	32	43.2	28.3	19.7	18	15.1	14.1	11.2	11.3		12.8	11.8	39.2	32.2	22.8	18.9
Carbonate																								
Ammonia (NH3-N)						<0.010												0.025						
Nitrogen Total (N)						0.39												0.059						
Chloride (Cl)	1080	1060	1050	1070	1050	1060	930	771	502	808	960	1030	1020	1030	1030	954	1010	990	1000	949	529	613	1040	1020
NATA EC	3530	3470	3540	3540	3560	3500	3310	2760	2000	2770	3220	3440	3450	3340	3300	3240	3310	3330	3290	3090	1960	2250	3270	3380
O2						7.4												3.9						
Phosphate as PO4-P						<0.005												<0.005						
Phosphorus Total (P)						0.082												0.11						
NATA pH	6	6.3	6.5	6.1	6.2	6.2	6.4	6.5	6.8	6.5	6.4	6.3	6.2	6.2	6.2	6.3	6.3	6.3	6.2	6.4	6.8	6.7	6.3	6.3
Potassium (K)	4.6	4.7	4.8	3.9	4.6		3.8	12.5	11	11.1	8.1	6.8	6.4	5.9	5.2	4.6	5.3		5.3	5.5	6.7	5.4	6	5.2
Sodium (Na)	585	596	592	605	606		567	413	237	452	542	533	628	565	540	548	539		584	544	295	327	532	525
Sulphate (SO_4^{2-})	190	150	150	150	150	140	140	120	74	120	130	110	130	140	130	140	140	140	140	140	85		150	120
TDS	2000	1700	2000	1800	1800	1700	1600	1500	1100	1500	1800	1800	2000	1900	1700	1800	1800	1900	1700	1600	1100	1300	1800	1700
Radium 226																								
Radium 228																								
Acrylamide																								
Eh																								
Sulphate:Chloride Ratio	0.18	0.14	0.14	0.14	0.14	0.13	0.15	0.16	0.15	0.15	0.14	0.11	0.13	0.14	0.13	0.15	0.14	0.14	0.14	0.15	0.16	0.00	0.14	0.12
Chloride:Sulphate Ratio	5.68	7.07	7.00	7.13	7.00	7.57	6.64	6.43	6.78	6.73	7.38	9.36	7.85	7.36	7.92	6.81	7.21	7.07	7.14	6.78	6.22	#DIV/0!	6.93	8.50

SCPD28A	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
Date	12/01/2021	4/02/2021	10/03/2021	14/04/2021	6/05/2021	3/06/2021	6/07/2021	9/08/2021	13/09/2021	12/10/2021	8/11/2021	22/12/2021	12/01/2022	9/02/2022	1/03/2022	6/04/2022	12/05/2022	5/07/2022	11/08/2022	31/08/2022	20/09/2022	19/10/2022	17/11/2022	14/12/2022
Casing Height above topo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Depth of bore	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00
SWL (m)	1.41	1.51	1.38	1.28	1.18	0.73	0.26	0	0.11	0.63	0.88	1.27	1.4	1.57	1.79	1.6	1.77	0.83	0.1	0.58	0.58	0.78	1	1.1
m AHD	19.79	19.69	19.82	19.92	20.02	20.47	20.94	21.20	21.09	20.57	20.32	19.93	19.80	19.63	19.41	19.60	19.43	22.97	22.97	22.97	22.97	22.97	22.97	22.97
Purge	41	40	41	42	42	45	48	49	49	46	44	42	40	40	39	39	38	40	50	45	45	44	43	40
Field pH	5.96	5.87	5.96	5.88	5.93	5.91	5.95	6.3	5.93	5.96	6	6	5.9	5.97	5.89	5.87	5.84	6.33	6.65	6.11	6.02	6.02	6.19	6.19
Temp	21.4	17	22.2	21.1	19.1	16.8	18.1	18.8	18.4	17.9	18.8	19.5	21	20.3	21.3	21.6	**19.6**	17.7	16	19	20	20	18.3	19.6
Field Cond (EC)	3530.00	3440.00	3500.00	3470.00	3610.00	3570.00	3560.00	3200.00	3550.00	3610.00	3590.00	3500.00	3660.00	3450.00	3410.00	3610.00	3640.00	3620.00	2870.00	3230.00	3120.00	3160.00	3130.00	2880.00
Field Salinity	1770	1720	1750	1740	1800	1780	1780	1600	1770	1800	1790	1750	1830	1720	1700	1810	1860	1810	1440	1620	1560	1570	1360	1440
Field ROP	408	451	453	515	443	450	442	366	348	363	423	382	433	403	350	386	370	315	394	332	349	330	310	310
Field Alkalinity	66	63	72	63	84	66	60	78	45	60	48	54	84	75	60	45	60	66	42	66	30	69	66	60
Field TTA	105.000	85	105	105	115	105	110	90	100	90	110	122	130	110	100	130	120	100	200	140	100	120	100	110
Field DO %S	16.9	14.3	13.1	15.7	15.1																			
Comments																								
Aluminium Filtered (Al)	0.020	0.026	0.032	0.016	0.008	0.007	0.019	0.15	0.026	0.042	0.025	0.026	0.01	0.033	0.023	0.021	0.023	<0.005	0.072	0.031	0.13	0.026	0.033	0.035
Aluminium Total (Al)												0.3						0.62			7.9			2.6
Arsenic (As)						0.0009						0.0012						0.0002			0.0011			0.0017
Arsenic (As) Total																		0.0008			0.0029			0.003
Boron (B)																								
Cadmium (Cd)						<0.0001						<0.0001						<0.0001			<0.0001			<0.0001
Cadmium (Cd) Total																		<0.0001			<0.0001			<0.0001
Calcium (Ca)																								
Chromium VI (Cr)												<.004						<0.004			<0.004			<0.004
Chromium VI (Cr) Total																		<0.004			<0.004			<0.004
Chromium (Cr)						<0.0001						0.0018						0.0003			0.0006			0.0008
Chromium Total (Cr)																		0.0033			0.011			0.0042
Cobalt (Co)						0.0004						0.0005						0.0006			0.008			0.0008
Cobalt (Co) Total																		0.0006			0.0017			0.0011
Copper (Cu)						0.0004						0.017						0.0015			0.016			0.024
Copper (Cu) Total																		0.0057			0.029			0.0051
Iron Filtered (Fe)	2.800	2.6	2.6	0.93	2	2.6	2.5	2.6	3.9	3.6	3.2	3.1	2.5	3.1	2.9	2.9	3.1	<0.005	1.8	2.3	2.8	2	4.5	4.7
Iron Total (Fe)												3.5						2.3			8			11
Lead (Pb)																		<0.0001			0.0006			0.0001
Manganese (Mn)	0.063	0.07	0.05	0.055	0.05	0.049	0.045	0.24	0.18	0.11	0.075	0.069	0.053	0.068	0.057	0.049	0.047	0.041	0.052	0.068	0.053	0.044	0.043	0.13
Magnesium (Mg)	58.6	68	65.9	63.7	62.8							62.7	58.4	63.2	64.1	60.7	59.6	54.7	60	62	60.4	55.2	55.5	46.3
Mercury (Hg)						<0.00005						<0.00005						<0.00005			<0.00005			<0.00005
Mercury (Hg) Total																		<0.00005			<0.00005			<0.00005
Molybdenum (Mo)																								
Nickel (Ni)						0.001						0.0013						0.0017			0.0016			0.0017
Nickel (Ni) Total																		0.0018			0.0028			0.0024
Selenium (Se)						<0.0002						<0.0002						<0.0002			<0.0002			<0.0002
Selenium (Se) Total																		<0.0002			<0.0002			<0.0002
Uranium (U						0.00001						0.0002						<0.0001			0.0001			0.0004
Uranium (U Total																		0.0001			0.0009			0.00056
Zinc (Zn)						0.065						0.11						0.097			0.09			0.01
Zinc (Zn) Total																		0.097			0.16			0.053
Thallium (Tl)						<0.0001						<0.0001						<0.0001			<0.0001			<0.0001
Thallium (Tl) Total																		<0.0001			<0.0001			<0.0001
CaCO3 (Acidity)	63	55	71	71	51	56	54	67	48	59	87	82	97	71	86	69	65	57	46	53	38	64	59	24
CaCO3 (Alkalinity)	62	59	65	60	57	60	62	78	66	60	63	60	57	59	58	62	68	64	71	63	66	68	63	100
Bicarbonate	62	59	64	60	57							60	57	59	58	62	68	64	71	63	66	68	63	100
Calcium	13.4	15.1	12.4	25.9	12.7							11.8	10.5	11.2	11	10.8	10.5	9.4	12.8	10.9	10.4	9.6	10	18.3
Carbonate																								
Ammonia (NH3-N)																								
Nitrogen Total (N)																								
Chloride (Cl)	1080	1060	1010	1040	1070	1060	1010	904	1030	1090	1040	986	983	1000	992	984	955	901	910	920	906	870	884	773
NATA EC	3530	3470	3340	3460	3550	3540	3370	3090	3430	3660	3530	3380	3390	3400	3350	3360	3330	3180	3210	3130	3180	2840	3080	2780
O2																								
Phosphate as PO4-P																								
Phosphorus Total (P)																								
NATA pH	6.3	6.3	6.2	6.2	6.3	6.4	6.3	7.5	6.4	6.5	6.1	6.2	6.3	6.2	6.4	6.6	6.3	6.4	6.5	6.6	6.6	6.4	6.9	7.1
Potassium (K)	4.7	6	5.2	5	5.1							5.2	4.5	4.9	4.7	4.7	4.7	4.2	5.1	5.1	4.8	4.6	4.5	4.3
Sodium (Na)	519	606	615	595	578	589	599	497	630	624	582	578	544	585	608	576	576	599	588	624	597	579	621	489
Sulphate (SO_4^{2-})	140	130	150	130	140	150	140	110	140	140	120	140	140	140	140	140	140	140	140	130	150	150	150	140
TDS	1800	1800	1900	2000	1800	1900	2000	1600	1700	1800	1700	1800	1700	1600	1700	1700	1600	1600	1500	1500	1600	1600	1500	1400
Radium 226		0.02				0.03						0.02						0.02			<0.01			<0.01
Radium 228		<0.08				<0.08						<0.08						<0.08			<0.08			<0.08
Acrylamide		<0.01																						
Eh																		359			414			552
Sulphate:Chloride Ratio	0.13	0.12	0.15	0.13	0.13	0.14	0.14	0.12	0.14	0.13	0.12	0.14	0.14	0.14	0.14	0.14	0.15	0.16	0.15	0.14	0.17	0.17	0.17	0.18
Chloride:Sulphate Ratio	7.71	8.15	6.73	8.00	7.64	7.07	7.21	8.22	7.36	7.79	8.67	7.04	7.02	7.14	7.09	7.03	6.82	6.44	6.50	7.08	6.04	5.80	5.89	5.52

DOW superficial "capel to dunsborough" 29A. only able to dip to 8.0m. Evidence of artesian Yoganup aquifer flow with iron staining at surface.

SCPD29A		Triggers	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17
Date								1/06/2017	25/07/2017	17/08/2017	20/09/2017	17/10/2017	13/11/2017	13/12/2017
Casing Height above topo	m	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Depth of bore	m	9.50		9.50	9.50	9.50	9.50	9.50	7.93	7.93	7.93	7.93	7.93	7.93
SWL (m)	m (from top of casing)							1	0.24	0	0	0	0.45	0.74
m AHD								33.8	34.56	34.8	34.8	34.8	34.35	34.06
Purge	L								92	114	114	114	109	105
Field pH		<5							5.62	5.64	5.67	5.45	5.6	5.48
Temp	degrees C								17.4	16.4	17.2	17.7	18.2	18
Field Cond (EC)	uS/cm	>1143.21							880.00	1100.00	950.00	920.00	840.00	890.00
Field Salinity	ppm								440	550	470	460	420	450
Field ROP	mv								129	126	162	212	142	200
Field Alkalinity		<26.19										42	54	51
Field TTA		>250.9										235	250	230
Field DO %S										18.5	11.4	13.5	11.3	10.5
Comments									L9					
Aluminium Filtered (Al)	mg/L	>1							0.028	0.015	0.008	0.046	0.036	0.024
Aluminium Total (Al)	mg/L								0.43		0.6			0.1
Arsenic (As)	mg/L								0.001		0.0011			0.0028
Arsenic (As) Total	mg/L													
Boron (B)	mg/L													
Cadmium (Cd)	mg/L								<0.0001		<0.0001			<0.0001
Cadmium (Cd) Total	mg/L													
Calcium (Ca)	mg/L													
Chromium (Cr)	mg/L								0.0001		<0.0001			0.0008
Chromium (Cr) Total	mg/L													
Chromium VI (Cr)	mg/L													
Chromium VI (Cr) Total	mg/L													
Cobolt (Co)	mg/L													
Cobolt (Co) Total	mg/L													
Copper (Cu)	mg/L													
Copper (Cu) Total	mg/L													
Iron Filtered (Fe)	mg/L	>7.93							6.9	3.9	6.4	7.2	6.6	6.5
Iron Total (Fe)	mg/L								7.5		7.1			6.6
Lead (Pb)	mg/L													
Manganese (Mn)	mg/L	>0.15							0.15	0.068	0.13	0.14	0.13	0.13
Magnesium (Mg)	mg/L									9.5		14.5	14.3	
Mercury (Hg)	mg/L													
Mercury (Hg) Total	mg/L													
Molybdenum (Mo)	mg/L													
Nickel (Ni)	mg/L								0.0006		0.0011			<0.0025
Nickel (Ni) Total	mg/L													
Selenium (Se)	mg/L								<0.0002		<0.0002			0.0003
Selenium (Se) Total	mg/L													
Uranium (U)	mg/L													
Uranium (U) Total	mg/L													
Zinc (Zn)	mg/L								0.015		0.02			0.015
Zinc (Zn) Total	mg/L													
Thallium (Tl)	mg/L													
Thallium (Tl) Total	mg/L													
CaCO3 (Acidity)	mg/L								160	110	110	79	93	120
CaCO3 (Alkalinity)	mg/L								38	39	40	37	28	37
Bicarbonate	mg/L									39		37	28	
Calcium	mg/L									1.8		2.8	2.8	
Carbonate	mg/L									<1		<1	<1	
Ammonia (NH3-N)	mg/L								0.018		0.032			0.046
Nitrogen Total (N)	mg/L								<0.025		0.067			0.12
Chloride (Cl)	mg/L	>274.71							210	270	210	200	200	200
NATA EC	uS/cm								823	994	796	772	798	783
O2	mg/L								3.2		2.8			2.9
Phosphate as PO4-P	mg/L								<0.005		0.005			<0.005
Phosphorus Total (P)	mg/L								0.012		0.015			0.029
NATA pH									5.9	5.8	5.9	5.8	5.8	5.7
Potassium (K)	mg/L									3.3		6.1	6.1	
Sodium (Na)	mg/L									78.7		99.1	116	
Sulphate (SO_4^{2-})	mg/L	>30.30							23	30	22	21	20	23
TDS	mg/L	>535.07							440	500	410	390	430	410
Eh	mV													
Radium 226														
Radium 228														
Acrylamide														
Sulphate:Chloride Ratio		>0.5							0.11	0.11	0.10	0.11	0.10	0.12
Chloride:Sulphate Ratio		<2.0							9.13	9.00	9.55	9.52	10.00	8.70

SCPD29A	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
Date	11/01/2018	12/02/2018	12/03/2018	12/04/2018	8/05/2018	12/06/2018	10/07/2018	8/08/2018	10/09/2018	9/10/2018	7/11/2018	6/12/2018
Casing Height above topo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Depth of bore	7.93	7.93	7.93	7.93	7.93	7.93	7.93	7.93	7.93	7.93	7.93	7.93
SWL (m)	0.91	0.93	1.09	1.2	1.22	0.8	0	0	0	0.18	0.5	0.78
m AHD	33.89	33.87	33.71	33.60	33.58	34.00	34.80	34.80	34.80	34.62	34.30	34.02
Purge	103	103	101	100	99	104	114	114	114	112	108	105
Field pH	5.43	5.47	5.42	5.29	5.33	5.57	5.43	5.52	5.38	5.3	5.16	5.24
Temp	18.3	18.9	19.3	19	17.9	17.1	16.2	17.9	17.2	18.8	17.9	17
Field Cond (EC)	950.00	850.00	860.00	870.00	860.00	980.00	1110.00	1180.00	1170.00	850.00	850.00	900.00
Field Salinity	470	430	430	44	430	460	560	590	590	430	430	450
Field ROP	227	203	250	255	279	281	389	429	258	320	319	233
Field Alkalinity	78	45	72	36	39	48	48	39	51	36	39	39
Field TTA	220	220	215	210	215	180	150	180	210	230	230	230
Field DO %S	9.7	9.4	11.3		9.5	18.7	16.4	16.9	14.4	12.8	13.6	17.6
Comments												
Aluminium Filtered (Al)	0.038	0.011	0.019	0.025	0.026	0.085	0.022	0.017	0.028	0.023	0.04	0.025
Aluminium Total (Al)			0.26			8.8						
Arsenic (As)			0.0005			0.0009						
Arsenic (As) Total												
Boron (B)												
Cadmium (Cd)			<0.0001			<0.0001						
Cadmium (Cd) Total												
Calcium (Ca)												
Chromium (Cr)			<0.0001			<0.0001						
Chromium (Cr) Total												
Chromium VI (Cr)												
Chromium VI (Cr) Total												
Cobolt (Co)												
Cobolt (Co) Total												
Copper (Cu)												
Copper (Cu) Total												
Iron Filtered (Fe)	6.3	5.6	6.7	5.7	6.4	6.4	5.9	4.9	4.6	7.2	7.4	6.1
Iron Total (Fe)			8.5			6.6						
Lead (Pb)												
Manganese (Mn)	0.13	0.11	0.13	0.11	0.13	0.14	0.11	0.11	0.097	0.14	0.14	0.12
Magnesium (Mg)	13.3	14.6		12	14		17.5	17.7	14.9	15.4	15.1	13.8
Mercury (Hg)												
Mercury (Hg) Total												
Molybdenum (Mo)												
Nickel (Ni)			0.0008			0.0018						
Nickel (Ni) Total												
Selenium (Se)			<0.0002			<0.0002						
Selenium (Se) Total												
Uranium (U)												
Uranium (U) Total												
Zinc (Zn)			0.006			0.006						
Zinc (Zn) Total												
Thallium (Tl)												
Thallium (Tl) Total												
CaCO3 (Acidity)	160	120	150	120	110	110	120	79	130	83	130	140
CaCO3 (Alkalinity)	40	40	40	29	40	36	41	33	32	35	40	39
Bicarbonate	40	40		29	40		41	33	32	35	40	39
Calcium	2.5	2.7		2.4	2.6		2.8	3.1	2.4	2.9	3.1	2.5
Carbonate												
Ammonia (NH3-N)			0.039			0.04						
Nitrogen Total (N)			0.039			0.43						
Chloride (Cl)	220	200	190	210	210	210	270	290	270	216	207	215
NATA EC	783	772	782	776	811	813	954	1020	958	783	798	803
O2			3			3.8						
Phosphate as PO4-P			0.006			<0.005						
Phosphorus Total (P)			0.006			0.035						
NATA pH	5.7	5.7	5.7	5.6	5.8	5.8	5.7	5.9	5.6	6	5.9	5.8
Potassium (K)	5.8	6		4.4	5.9		5	5.6	4.5	7.2	6.4	5.8
Sodium (Na)	109	118		103	109		151	156	133	121	124	106
Sulphate (SO_4^{2-})	26	25	21	21	22	23	28	30	29	21	21	21
TDS	452	399	417	388	434	429	531	540	508	420	440	420
Eh												
Radium 226												
Radium 228												
Acrylamide												
Sulphate:Chloride Ratio	0.12	0.13	0.11	0.10	0.10	0.11	0.10	0.10	0.11	0.10	0.10	0.10
Chloride:Sulphate Ratio	8.46	8.00	9.05	10.00	9.55	9.13	9.64	9.67	9.31	10.29	9.86	10.24

SCPD29A	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
Date	9/01/2019	7/02/2019	12/03/2019	9/04/2019	7/05/2019	11/06/2019	9/07/2019	8/08/2019	9/09/2019	8/10/2019	7/11/2019	10/12/2019
Casing Height above topo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Depth of bore	7.93	7.93	7.93	7.93	7.93	7.93	7.93	7.93	7.93	7.93	7.93	7.93
SWL (m)	0.99	1.14	1.22	1.34	1.37	1.02	0	0.03	0	0.22	0.58	0.94
m AHD	33.81	33.66	33.58	33.46	33.43	33.78	34.80	34.77	34.80	34.58	34.22	33.86
Purge	102	100	99	98	98	102	114	114	114	111	107	103
Field pH	5.2	5.37	5.42	5.37	5.5	5.6	5.43	5.38	5.5	5.38	5.57	5.53
Temp	19.4	19.1	18.9	19	19.3	16.7	17.2	15.4	17.4	16.4	18.1	18.6
Field Cond (EC)	900.00	970.00	980.00	1030.00	930.00	960.00	960.00	1020.00	1090.00	980.00	930.00	1030.00
Field Salinity	450	490	490	520	460	480	480	510	550	490	460	510
Field ROP	293	223	157	234	299	248	359	343	314	318	317	351
Field Alkalinity	42	42	45	42	48	39	48	45	39	33	39	45
Field TTA	220	240	230	210	225	165	160	165	175	175	170	190
Field DO %S	17.4	15.9	18.1	16.8	15.4	15.6	16.1	15.5	16.2	19.5	21.1	19.8
Comments												
Aluminium Filtered (Al)	0.019	0.017	0.009	0.014	0.048	0.012	0.015	0.03	0.011	0.013	0.014	0.008
Aluminium Total (Al)						0.1						
Arsenic (As)						0.0008						
Arsenic (As) Total												
Boron (B)												
Cadmium (Cd)						<0.0001						
Cadmium (Cd) Total												
Calcium (Ca)												
Chromium (Cr)						<0.0001						
Chromium (Cr) Total												
Chromium VI (Cr)												
Chromium VI (Cr) Total												
Cobolt (Co)												
Cobolt (Co) Total												
Copper (Cu)												
Copper (Cu) Total												
Iron Filtered (Fe)	6.8	7.1	7.3	6.2	7.2	6.5	6.2	5.7	6	6.7	6.9	6.2
Iron Total (Fe)						8.7						
Lead (Pb)												
Manganese (Mn)	0.13	0.13	0.14	0.12	0.14	0.13	0.14	0.13	0.11	0.13	0.13	0.11
Magnesium (Mg)	15	14.7	15.8	13	15.6		15.6	15.5	17.7	14.1	14.1	12.3
Mercury (Hg)												
Mercury (Hg) Total												
Molybdenum (Mo)												
Nickel (Ni)						0.0013						
Nickel (Ni) Total												
Selenium (Se)						<0.0002						
Selenium (Se) Total												
Uranium (U)												
Uranium (U) Total												
Zinc (Zn)						0.017						
Zinc (Zn) Total												
Thallium (Tl)												
Thallium (Tl) Total												
CaCO3 (Acidity)	110	85	72	150	80	110	100	120	120	62	150	120
CaCO3 (Alkalinity)	41	28	28	40	27	37	32	29	38	31	38	36
Bicarbonate	41	28	28	40	27		32	29	38	31	38	36
Calcium	2.9	2.9	3.1	2.7	2.9		3	2.9	2.9	2.6	2.7	2.4
Carbonate												
Ammonia (NH3-N)						0.036						
Nitrogen Total (N)						0.061						
Chloride (Cl)	194	217	224	222	225	235	222	228	262	210	210	220
NATA EC	796	802	831	859	841	867	870	870	1010	781	803	812
O2						4.3						
Phosphate as PO4-P						<0.005						
Phosphorus Total (P)						0.013						
NATA pH	5.9	5.9	6.2	5.8	5.9	5.9	5.9	5.7	5.9	5.9	5.9	5.9
Potassium (K)	6.4	6.7	7	5.8	6.8		6.4	6.4	5.8	5.8	6.6	6
Sodium (Na)	117	118	123	131	124		126	133	162	112	115	103
Sulphate (SO_4^{2-})	18	24	25	24	24	26	25	24	29	22	21	22
TDS	450	420	510	460	420	440	450	480	550	410	410	420
Eh												
Radium 226												
Radium 228												
Acrylamide												
Sulphate:Chloride Ratio	0.09	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.10	0.10	0.10
Chloride:Sulphate Ratio	10.78	9.04	8.96	9.25	9.38	9.04	8.88	9.50	9.03	9.55	10.00	10.00

SCPD29A	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Date	9/01/2020	11/02/2020	10/03/2020	8/04/2020	7/05/2020	8/06/2020	8/07/2020	6/08/2020	7/09/2020	12/10/2020	5/11/2020	7/12/2020
Casing Height above topo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Depth of bore	7.93	7.93	7.93	7.93	7.93	7.93	7.93	7.93	7.93	7.93	7.93	7.93
SWL (m)	1.08	1.33	1.34	1.38	1.51	0.72	0.05	0	0	0.13	0.41	0.57
m AHD	33.72	33.47	33.46	33.42	33.29	34.08	34.75	34.80	34.80	34.67	34.39	34.23
Purge	51	49	49	48	48	53	57	57	57	56	55	54
Field pH	5.43	5.41	5.34	5.36	5.42	5.28	5.56	5.53	5.58	5.45	5.39	5.45
Temp	18.2	19.7	19	20.3	19.1	19.2	17	16.5	16.8	18.5	17.2	18.4
Field Cond (EC)	820.00	840.00	850.00	820.00	850.00	790.00	830.00	1010.00	1000.00	810.00	800.00	830.00
Field Salinity	410	420	420	410	420	400	410	500	500	410	400	410
Field ROP	355	435	404	478	445	412	402	393	413	387	431	412
Field Alkalinity	42	45	42	45	48	45	45	45	42	45	45	48
Field TTA	180	190	190	205	190	190	210	200	170	220	220	210
Field DO %S	22.8	14.1	13.2	14.8	14.2	21.9	21.6	21.9	17.2	15.1	18.1	16.3
Comments												
Aluminium Filtered (Al)	0.015	0.033	0.011	0.016	0.017	0.025	0.026	0.009	0.02	0.027	0.014	0.013
Aluminium Total (Al)						0.66						
Arsenic (As)						0.0007						
Arsenic (As) Total												
Boron (B)												
Cadmium (Cd)						<0.0001						
Cadmium (Cd) Total												
Calcium (Ca)												
Chromium (Cr)						0.0002						
Chromium (Cr) Total												
Chromium VI (Cr)												
Chromium VI (Cr) Total												
Cobolt (Co)												
Cobolt (Co) Total												
Copper (Cu)												
Copper (Cu) Total												
Iron Filtered (Fe)	7.4	6.4	6.3	6.9	7.000	6.8	6.9	6.6	4.3	6.5	6.5	6.9
Iron Total (Fe)						9.7						
Lead (Pb)												
Manganese (Mn)	0.13	0.12	0.12	0.13	0.140	0.13	0.14	0.12	0.11	0.13	0.13	0.13
Magnesium (Mg)	14.2	13.5	13	14.8	15		14.4	17.4	16.5	13.3	13.1	13.7
Mercury (Hg)												
Mercury (Hg) Total												
Molybdenum (Mo)												
Nickel (Ni)						0.0011						
Nickel (Ni) Total												
Selenium (Se)						<0.0002						
Selenium (Se) Total												
Uranium (U)												
Uranium (U) Total												
Zinc (Zn)						0.008						
Zinc (Zn) Total												
Thallium (Tl)												
Thallium (Tl) Total												
CaCO3 (Acidity)	130	140	140	130	110	110	130	120	76	110	100	94
CaCO3 (Alkalinity)	29	40	38	28	39	38	37	28	30	33	35	31
Bicarbonate	29	40	38	28	39		37	28	30	33	35	31
Calcium	2.6	2.5	2.5	2.6	2.8		2.8	2.9	3	2.7	2.6	2.9
Carbonate												
Ammonia (NH3-N)						0.035						
Nitrogen Total (N)						0.079						
Chloride (Cl)	206	214	215	212	212	210	212	272	265	210	209	205
NATA EC	755	780	773	757	778	771	797	965	961	771	770	761
O2						4						
Phosphate as PO4-P						0.007						
Phosphorus Total (P)						0.028						
NATA pH	5.7	5.9	5.9	5.7	5.9	5.9	5.8	5.7	6	5.9	5.9	5.8
Potassium (K)	6.6	6.2	5.9	6.5	7.7		7	6.2	5.1	6.2	6.5	6.4
Sodium (Na)	115	111	110	115	128		117	153	149	110	107	107
Sulphate (SO_4^{2-})	22	21	21	22	21	21	21	30	30	21	21	22
TDS	410	440	410	410	430	420	410	510	540	410	390	380
Eh												
Radium 226												
Radium 228												
Acrylamide												
Sulphate:Chloride Ratio	0.11	0.10	0.10	0.10	0.10	0.10	0.10	0.11	0.11	0.10	0.10	0.11
Chloride:Sulphate Ratio	9.36	10.19	10.24	9.64	10.10	10.00	10.10	9.07	8.83	10.00	9.95	9.32

SCPD29A	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
Date	12/01/2021	4/02/2021	9/03/2021	14/04/2021	6/05/2021	3/06/2021	6/07/2021	5/08/2021	7/09/2021	12/10/2021	1/11/2021	14/12/2021
Casing Height above topo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Depth of bore	7.93	7.93	7.93	7.93	7.93	7.93	7.93	7.93	7.93	7.93	7.93	7.93
SWL (m)	0.89	1.06	0.96	1.04	0.75	0.4	0	0	0	0	0	0
m AHD	33.91	33.74	33.84	33.76	34.05	34.40	34.80	34.80	34.80	34.80	34.80	34.80
Purge	52	51	51	51	53	55	57	57	57	57	57	65
Field pH	5.43	5.4	5.4		5.51	5.56	5.48	5.67	5.59	5.6	5.62	5.69
Temp	18.2	15.5	21.9		19.3	17.2	17.3	18.1	17.2	16.7	17.9	18.2
Field Cond (EC)	810.00	840.00	840.00		880.00	880.00	930.00	1090.00	1090.00	1080.00	1160.00	870.00
Field Salinity	400	420	420		440	440	470	550	550	540	580	430
Field ROP	394	435	399		435	423	434	404	343	387	401	
Field Alkalinity	45	45	56		66	45	24	45	42	45	30	50
Field TTA	170.000	150	182		215	190	170	120	150	175	170	200
Field DO %S	15.7	16.3	16.7		17.7							
Comments												
Aluminium Filtered (Al)	0.011	0.024	0.03		0.015	<0.005	0.019	<0.005	0.01	0.015	0.017	0.02
Aluminium Total (Al)												
Arsenic (As)												
Arsenic (As) Total												
Boron (B)												
Cadmium (Cd)												
Cadmium (Cd) Total												
Calcium (Ca)												
Chromium (Cr)												
Chromium (Cr) Total												
Chromium VI (Cr)												
Chromium VI (Cr) Total												
Cobolt (Co)												
Cobolt (Co) Total												
Copper (Cu)												
Copper (Cu) Total												
Iron Filtered (Fe)	5.800	7.1	7.3		7.3	6.5	7.3	<0.005	6.1	6.5	6.4	7.5
Iron Total (Fe)												
Lead (Pb)												
Manganese (Mn)	0.110	0.14	0.14		0.14	0.13	0.15	0.12	0.11	0.12	0.12	0.14
Magnesium (Mg)	11.9	14.4	15.1		15.3							14.6
Mercury (Hg)												
Mercury (Hg) Total												
Molybdenum (Mo)												
Nickel (Ni)												
Nickel (Ni) Total												
Selenium (Se)												
Selenium (Se) Total												
Uranium (U)												
Uranium (U) Total												
Zinc (Zn)												
Zinc (Zn) Total												
Thallium (Tl)												
Thallium (Tl) Total												
CaCO3 (Acidity)	100	120	150		110	110	95	85	110	120	120	150
CaCO3 (Alkalinity)	32	63	43		26	30	39	29	34	34	40	43
Bicarbonate	32	63	43		26							43
Calcium	2.2	3	3		3.2							3.1
Carbonate												
Ammonia (NH3-N)												
Nitrogen Total (N)												
Chloride (Cl)	211	212	211		214	213	227	271	278	283	268	208
NATA EC	778	778	790		796	796	823	1020	1040	1050	1040	765
O2												
Phosphate as PO4-P												
Phosphorus Total (P)												
NATA pH	5.8	5.8	5.8		5.7	5.9	6	5.9	5.8	6	5.8	5.7
Potassium (K)	5.8	7.5	7.8		7.6							7.6
Sodium (Na)	102	116	123		122	104	123	153	160	160	159	118
Sulphate (SO_4^{2-})	22	21	26		21	22	23	30	30	31	31	20
TDS	380	390	460		410	440	450	510	550	480	510	390
Eh												
Radium 226												
Radium 228												
Acrylamide												
Sulphate:Chloride Ratio	0.10	0.10	0.12	#DIV/0!	0.10	0.10	0.10	0.11	0.11	0.11	0.12	0.10
Chloride:Sulphate Ratio	9.59	10.10	8.12	#DIV/0!	10.19	9.68	9.87	9.03	9.27	9.13	8.65	10.40

SCPD29A	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
Date	6/01/2022	9/02/2022	3/03/2022	6/04/2022	12/05/2022	21/06/2022	5/07/2022	10/08/2022	8/09/2022	18/10/2022	9/11/2022	30/11/2022
Casing Height above topo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Depth of bore	7.93	7.93	7.93	7.93	7.93	7.93	7.93	7.93	7.93	7.93	7.93	7.93
SWL (m)	0.83	1.06	1.15	1.27	1.22	0.69	0.51	0	0	0.35	0.68	0.72
m AHD	34.80	34.80	34.80	34.80	34.80	34.80	34.80	34.80	34.80	34.80	34.80	34.80
Purge	52	50	50	49	48	54	60	63	63	55	50	45
Field pH	5.6	5.62	5.56	5.6	5.63	5.8	5.63	6.48	5.67	5.57	5.6	5.56
Temp	20.3	19	19.2	18.6	17.6	18.2	17.6	17.3	17.6	17.8	18	20.3
Field Cond (EC)	900.00	890.00	1010.00	970.00	1000.00	1300.00	1020.00	800.00	1040.00	810.00	820.00	840.00
Field Salinity	450	440	510	480	510	650	520	440	520	400	410	420
Field ROP	377	398	285	338	359	263	315	373	369	490	410	370
Field Alkalinity	63	60	45	33	65	75	36	34	39	51	60	45
Field TTA	190	200	200	150	190	220	200	156	200	220	200	180
Field DO %S												
Comments												
Aluminium Filtered (Al)	0.019	0.019	0.019	0.03	0.025	0.031	0.043	0.45	0.011	0.019	0.024	0.035
Aluminium Total (Al)						2.1			0.41			
Arsenic (As)						0.0007			0.001			
Arsenic (As) Total						0.003			0.0018			
Boron (B)												
Cadmium (Cd)						<0.0001			<0.0001			
Cadmium (Cd) Total						<0.0001			<0.0001			
Calcium (Ca)												
Chromium (Cr)						0.0002			<0.0001			
Chromium (Cr) Total						0.011			0.006			
Chromium VI (Cr)						0.008			<0.004			
Chromium VI (Cr) Total						<0.004			<0.004			
Cobolt (Co)						0.0004			0.0003			
Cobolt (Co) Total						0.0082			0.0033			
Copper (Cu)						<0.0001			0.0006			
Copper (Cu) Total						0.0026			0.0012			
Iron Filtered (Fe)	6.4	6.9	7.1	6.7	6.5	6.3	6.6	4.8	6.5	6.9	7	7.1
Iron Total (Fe)						8.5			6.7			
Lead (Pb)						<0.0001			<0.0001			
Manganese (Mn)	0.13	0.14	0.14	0.13	0.14	0.14	0.14	0.22	0.13	0.14	0.13	0.14
Magnesium (Mg)	13.3	15	14.6	14	14.8	14.1	15.5	11	20.9	14.1	14.8	15.2
Mercury (Hg)						<0.00005			<0.00005			
Mercury (Hg) Total						<0.00005			<0.00005			
Molybdenum (Mo)												
Nickel (Ni)						0.0014			0.001			
Nickel (Ni) Total						0.01			0.0042			
Selenium (Se)						<0.0002			<0.0002			
Selenium (Se) Total						<0.0002			<0.0002			
Uranium (U)						<0.0001			0.0001			
Uranium (U) Total						0.001			0.0007			
Zinc (Zn)						0.023			0.007			
Zinc (Zn) Total						0.051			0.014			
Thallium (Tl)						<0.0001			<0.0001			
Thallium (Tl) Total						0.0001			<0.0001			
CaCO3 (Acidity)	130	110	130	130	60	140	120	29	110	130	140	89
CaCO3 (Alkalinity)	34	30	29	30	33	35	34	51	30	29	36	37
Bicarbonate	34	30	29	30	33	35	34	51	30	29	36	37
Calcium	3	3.2	3	2.9	3.3	3.3	3.7	11.9	4	3.2	3.1	3
Carbonate												
Ammonia (NH3-N)												
Nitrogen Total (N)												
Chloride (Cl)	211	214	209	209	212	217	211	104	273	208	214	210
NATA EC	769	776	785	791	788	796	795	425	1000	762	774	806
O2												
Phosphate as PO4-P												
Phosphorus Total (P)												
NATA pH	5.8	5.7	5.7	6.1	6	5.6	5.8	6.5	5.6	5.6	6.2	6.4
Potassium (K)	6.6	7.6	7.1	6.7	7.2	6.8	7.1	4.6	6.6	7.1	7.5	8.1
Sodium (Na)	117	117	116	115	122	115	129	63	172	116	113	129
Sulphate (SO_4^{2-})	19	21	22	21	21	21	21	12	30	23	21	21
TDS	410	390	380	390	410	410	400	280	520	410	420	410
Eh						384			430			
Radium 226						0.04			<0.01			
Radium 228						<0.08			<0.08			
Acrylamide												
Sulphate:Chloride Ratio	0.09	0.10	0.11	0.10	0.10	0.10	0.10	0.12	0.11	0.11	0.10	0.10
Chloride:Sulphate Ratio	11.11	10.19	9.50	9.95	10.10	10.33	10.05	8.67	9.10	9.04	10.19	10.00

LOT1426 SOUTH. BASHFORD ENTRANCE-DEEPER BORE. TS PREFIX.SCREENED 7-9M DEPTH IN YOGANUP. DIPPED TO 9.75M INC SURFace casing
Iluka medium bore driveway to Neils house. Can access with camera

TS012M		Triggers	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
Date							31/05/2017	########	########	########	########	########	########	########	16/01/2018	14/02/2018	14/03/2018	17/04/2018	10/05/2018	14/06/2018	10/07/2018	8/08/2018	10/09/2018	9/10/2018	8/11/2018	6/12/2018
Casing Height above topo	m	0.48		0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48
Depth of bore	m	9.75		9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75
SWL (m)	m (from top of casing)						3.5	3.44	2.88	1.68	1.82	1.86	2.14	2.49	2.83	3.07	3.32	3.58	3.68	2.76	2.33	1.82	1.59	1.88	2.12	2.44
m AHD							26.224	26.284	26.844	28.044	27.904	27.864	27.584	27.234	26.89	26.65	26.40	26.14	26.04	26.96	27.39	27.90	28.13	27.84	27.60	27.28
Purge	L							196	213	250	245	245	236	225	215	209	199	191	188	217	230	246	253	244	237	227
Field pH		<5	9.00					5.86	6.05	5.97	5.49	5.8	5.99	5.86	5.68	5.8	5.74	5.54	5.58	5.6	5.57	5.63	5.56	5.41	5.41	5.41
Temp	degrees C							17	18.6	18.4	17.7	18.3	19	18.2	19.1	17.8	19.4	18.1	17.3	16.1	18.7	18.3	18	20.1	17.8	18.9
Field Cond (EC)	uS/cm	>2375.82						1120.00	1250.00	1360.00	1360.00	1460.00	1420.00	1470.00	1670.00	1510.00	1520.00	1620.00	1710.00	2000.00	1960.00	1940.00	1960.00	1950.00	2020.00	2070.00
Field Salinity	ppm							560	620	680	680	730	710	730	850	760	760	810	850	1030	980	970	980	970	1010	1030
Field ROP	mv							93	210	105	209	294	227	338	299	334	340	310	310	354	407	437	216	273	332	232
Field Alkalinity		<41.68									87	78	102	84	92	78	108	51	63	63	72	72	72	66	63	69
Field TTA		>268.64									244	210	203	165	155	185	190	220	200	200	200	200	210	220	220	235
Field DO %S									15.1	10.8	9.6	10.6	10.2	11.2	10	12.4	9.2		10.3	12.6	12.1	12.7	15.7	14.2	14.7	15.7
Comments																										
Aluminium Filtered (Al)	mg/L	>1						0.005	0.01	0.007	0.007	0.009	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.006	0.011	0.009	0.008	0.01	0.012	0.013
Aluminium Total (Al)	mg/L							0.02			0.013			0.006			<0.005			0.023						
Arsenic (As)	mg/L							<0.0001			<0.0001			<0.0001			<0.0001			<0.0001						
Arsenic (As) Total	mg/L																									
Boron (B)	mg/L																									
Cadmium (Cd)	mg/L							<0.0001			<0.0001			<0.0001			<0.0001			<0.0001						
Cadmium (Cd) Total	mg/L																									
Calcium (Ca)	mg/L																									
Chromium (Cr)	mg/L							<0.0001			<0.0001			0.0001			<0.0001			<0.0001						
Chromium (Cr) Total	mg/L																									
Chromium VI (Cr)	mg/L																									
Chromium VI (Cr) Total	mg/L																									
Cobolt (Co)	mg/L																									
Cobolt (Co) Total	mg/L																									
Copper (Cu)	mg/L																									
Copper (Cu) Total	mg/L																									
Iron Filtered (Fe)	mg/L	>22.43						0.64	1.2	1.7	0.71	1.9	2.5	1.8	2	1.6	1.9	1.6	1.3	4.6	7.3	8.2	6.4	8.5	8.9	8.2
Iron Total (Fe)	mg/L							0.71			1.2			2.1			2.1			6						
Lead (Pb)	mg/L																									
Manganese (Mn)	mg/L	>0.06						0.015	0.019	0.023	0.023	0.025	0.032	0.031	0.033	0.027	0.026	0.033	0.032	0.049	0.038	0.041	0.04	0.049	0.048	0.041
Magnesium (Mg)	mg/L								63.8	65		69	69.6		66.8	75.4		77	71.5		81.4	80.7	79.6	102	98	87.7
Mercury (Hg)	mg/L																									
Mercury (Hg) Total	mg/L																									
Molybdenum (Mo)	mg/L																									
Nickel (Ni)	mg/L							<0.0005			<0.0005			<0.0005			<0.0005			<0.0005						
Nickel (Ni) Total	mg/L																									
Selenium (Se)	mg/L							<0.0002			<0.0002			0.0006			<0.0002			<0.0002						
Selenium (Se) Total	mg/L																									
Uranium (U)	mg/L																									
Uranium (U) Total	mg/L																									
Zinc (Zn)	mg/L							0.001			0.008			0.007			0.006			0.009						
Zinc (Zn) Total	mg/L																									
Thallium (Tl)	mg/L																									
Thallium (Tl) Total	mg/L																									
CaCO3 (Acidity)	mg/L							110	97	89	83	86	110	120	99	110	130	65	93	140	150	97	130	90	160	150
CaCO3 (Alkalinity)	mg/L							87	92	92	79	79	76	68	71	69	66	63	59	70	73	64	55	56	64	59
Bicarbonate	mg/L								92	92		79	76		71	69		63	59		73	64	55	56	64	59
Calcium	mg/L								20.1	19.7		22.3	22.7		21.6	23.5		24.7	23.5		26.6	27.3	26.1	33	33.5	26.7
Carbonate	mg/L								<1	<1		<1	<1													
Ammonia (NH3-N)	mg/L							1.8			1.8			1.6			1.7			2						
Nitrogen Total (N)	mg/L							4.6			4.3			10			11			3.5						
Chloride (Cl)	mg/L	>597.36						230	280	290	300	290	300	300	330	370	350	360	400	500	510	490	450	510	506	523
NATA EC	uS/cm							1090	1180	1220	1270	1270	1340	1330	1390	1420	1430	1510	1570	1890	1740	1780	1720	1800	1930	1920
O2	mg/L							2.8			3.1			3.2			2.8			3.8						
Phosphate as PO4-P	mg/L							<0.005			<0.005			0.016						<0.005						
Phosphorus Total (P)	mg/L							0.012			0.023			0.024			0.011			0.021						
NATA pH								6.3	6.4	6.2	6.3	6.1	6.1	6	6	6	6	6.2	5.9	5.9	5.9	6.1	6	5.8	5.9	5.8
Potassium (K)	mg/L							13.9	13.6		13.5	14.7		13.1	15		14.2	13.5		12.8	14.3	12.6	19.4	16.3	14.4	17.3
Sodium (Na)	mg/L							102	91.8		100	123		118	134		131	128		142	141	133	170	170	151	179
Sulphate (SO_4^{2-})	mg/L	>259.19					80	74	78	76	78	80	94	100	100	91	94	97	110	100	100	110	120	110	110	120
TDS	mg/L	>1310.69					610	640	630	610	700	750	666	774	862	754	800	875	1010	1130	986	907	1000	1100	1000	1200
Eh	mV																									
Radium 226																										
Radium 228																										
Acrylamide																										
Sulphate:Chloride Ratio		>0.64						0.32	0.28	0.26	0.26	0.28	0.31	0.33	0.30	0.25	0.27	0.27	0.28	0.20	0.20	0.22	0.27	0.22	0.22	0.23
Chloride:Sulphate Ratio		<0.75						3.11	3.59	3.82	3.85	3.63	3.19	3.00	3.30	4.07	3.72	3.71	3.64	5.00	5.10	4.45	3.75	4.64	4.60	4.36

TS012M	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Date	9/01/2019	7/02/2019	12/03/2019	9/04/2019	8/05/2019	11/06/2019	9/07/2019	8/08/2019	9/09/2019	8/10/2019	7/11/2019	10/12/2019	9/01/2020	10/01/2020	9/03/2020	8/04/2020	7/05/2020	8/06/2020	8/07/2020	6/08/2020	7/09/2020	12/10/2020	5/11/2020	7/12/2020
Casing Height above topo	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48
Depth of bore	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75
SWL (m)	2.79	3.2	3.47	3.56	3.8	3.69	2.83	2.72	2.58	2.71	2.96	3.3	3.61	3.86	4.02	4.1	4.21	3.88	3.38	2.68	2.46	2.61	2.81	2.97
m AHD	26.93	26.52	26.25	26.16	25.92	26.03	26.89	27.00	27.14	27.01	26.76	26.42	26.11	25.86	25.70	25.62	25.51	25.84	26.34	27.04	27.26	27.11	26.91	26.75
Purge	210	203	195	183	184	188	215	218	222	218	210	200	92	88	86	85	33	88	95	106	109	107	104	102
Field pH	5.3	5.3	5.43	5.43	5.63	5.68	5.65	5.67	5.67	5.58	5.58	5.56	5.56	5.6	5.61	5.39	5.48	5.44	5.73	5.74	5.63	5.55	5.57	5.73
Temp	20	20.8	20.5	20.2	18.8	16.4	18.6	15.6	16.5	17	17.9	18.2	17.7	19.2	19.6	19.4	17.6	18.7	16.5	16.3	15.9	17.2	16.9	17.8
Field Cond (EC)	2100.00	2170.00	2220.00	2250.00	2120.00	2080.00	2290.00	2190.00	2080.00	2190.00	2200.00	2310.00	1990.00	1990.00	1990.00	1970.00	2010.00	1850.00	1930.00	1860.00	1860.00	1890.00	1890.00	1730.00
Field Salinity	1050	1080	1110	1130	1060	1040	1140	1100	1040	1100	1100	1160	990	990	990	990	1000	920	960	930	930	940	940	870
Field ROP	350	339	322	320	302	270	334	275	340	276	321	292	354	350	409	485	437	426	419	420	426	403	444	431
Field Alkalinity	69	72	69	69	63	60	81	87	57	54	57	66	51	60	60	57	54	57	66	81	66	69	66	60
Field TTA	265	290	255	250	240	200	260	210	240	190	200	200	190	205	200	185	170.000	215	250	245	230	240	215	200
Field DO %S	16.3	15.4	17.2	15.3	12.6	12.9	14.9	14.5	16.3	19.4	21.2	21	23.6	15.5	14,7	13.7	12.9	12.6	13.1	16.4	14.4	13.8	17.3	16.4
Comments																								
Aluminium Filtered (Al)	0.018	0.019	0.011	0.013	0.01	0.015	0.037	0.029	0.027	0.015	0.018	0.009	0.016	0.018	0.012	0.014	0.017	0.014	0.028	0.032	0.024	0.023	0.013	0.009
Aluminium Total (Al)						0.07												0.037						
Arsenic (As)						0.0001												0.0001						
Arsenic (As) Total																								
Boron (B)																								
Cadmium (Cd)						<0.0001												<0.0001						
Cadmium (Cd) Total																								
Calcium (Ca)																								
Chromium (Cr)						<0.0001												<0.0001						
Chromium (Cr) Total																								
Chromium VI (Cr)																								
Chromium VI (Cr) Total																								
Cobolt (Co)																								
Cobolt (Co) Total																								
Copper (Cu)																								
Copper (Cu) Total																								
Iron Filtered (Fe)	11	12	12	10	12	12	27	29	22	14	11	8.2	11	11	9.5	9.6	11.000	14	22	27	19	15	12	13
Iron Total (Fe)						14												17						
Lead (Pb)																								
Manganese (Mn)	0.048	0.049	0.05	0.042	0.047	0.049	0.056	0.056	0.053	0.047	0.041	0.034	0.037	0.041	0.039	0.04	0.038	0.038	0.04	0.055	0.045	0.043	0.037	0.039
Magnesium (Mg)	103	105	105	89.8	100		111	103	101	101	104	82.4	90.8	96.4	99.7	95.8	88		89.4	86	89.2	88.7	88.1	81.9
Mercury (Hg)																								
Mercury (Hg) Total																								
Molybdenum (Mo)																								
Nickel (Ni)						0.0006												<0.0005						
Nickel (Ni) Total																								
Selenium (Se)						<0.0002												<0.0002						
Selenium (Se) Total																								
Uranium (U)																								
Uranium (U) Total																								
Zinc (Zn)						0.011												0.003						
Zinc (Zn) Total																								
Thallium (Tl)																								
Thallium (Tl) Total																								
CaCO3 (Acidity)	120	110	84	170	160	130	160	140	160	86	150	120	140	160	140	130	120	160	170	140	150	140	120	120
CaCO3 (Alkalinity)	58	40	49	56	54	53	58	20	55	47	46	50	35	52	52	35	50	55	67	29	57	52	49	39
Bicarbonate	58	40	49	56	54		58	20	55	47	46	50	35	52	52	35	50		67	29	57	52	49	39
Calcium	33.4	34.4	35.6	31.4	33.5		37.6	36.1	35.3	32.3	32.8	26.6	28.5	30.1	31.9	29.7	28.3		30.2	30.2	30	29.3	28	28.8
Carbonate																								
Ammonia (NH3-N)						1.2												1.1						
Nitrogen Total (N)						6.2												3.6						
Chloride (Cl)	522	524	522	512	507	524	531	519	484	516	515	505	498	512	506	507	493	471	449	420	442	440	442	380
NATA EC	1990	1970	2020	1960	1990	2000	2190	2010	1990	1930	2010	2000	1900	1960	1930	1860	1930	1880	1860	1780	1810	1830	1820	1670
O2						3.7												4.3						
Phosphate as PO4-P						<0.005												<0.005						
Phosphorus Total (P)						0.013												0.011						
NATA pH	6	5.9	6.2	5.9	5.9	6	6	5.4	6	6	5.9	6	5.7	5.9	5.9	5.7	6	6	6	5.6	6	6	6	5.8
Potassium (K)	18	18.9	15.6	18.4		18.6	20.2	19.9	15.9	16.5	14.7	15.9	16.3	15.6	16.2	17.7		18.1	18.2	16.3	16.3	15.8	15.5	12.9
Sodium (Na)	186	185	158	180		208	202	193	176	179	158	179	182	180	180	174		181	182	175	170	162	155	142
Sulphate (SO_4^{2-})	160	160	160	160	150	190	150	160	180	170	160	170	180	170	176	180	200	210	240	210	220	210	210	220
TDS	1100	1300	1100	1200	1100	1200	1200	1100	1100	1100	1100	1100	1100	1200	1100	1100	1100	1100	1000	1100	1100	1000	850	920
Eh																								
Radium 226																								
Radium 228																								
Acrylamide																								
Sulphate:Chloride Ratio	0.31	0.31	0.31	0.31	0.30	0.36	0.28	0.31	0.37	0.33	0.31	0.34	0.36	0.33	0.35	0.36	0.41	0.45	0.53	0.50	0.50	0.48	0.48	0.58
Chloride:Sulphate Ratio	3.26	3.28	3.26	3.20	3.38	2.76	3.54	3.24	2.69	3.04	3.22	2.97	2.77	3.01	2.88	2.82	2.47	2.24	1.87	2.00	2.01	2.10	2.10	1.73

TS012M	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
Date	12/01/2021	4/02/2021	9/03/2021	14/04/2021	6/05/2021	3/06/2021	6/07/2021	10/08/2021	6/09/2021	12/10/2021	1/11/2021	8/12/2021	11/01/2022	8/02/2022	3/03/2022	7/04/2022	12/05/2022	22/06/2022	20/07/2022	9/08/2022	13/09/2022	18/10/2022	9/11/2022	30/11/2022
Casing Height above topo	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48
Depth of bore	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75	9.75
SWL (m)	3.38	3.63	3.72	3.78	3.71	3.48	3.05	1.99	2.07	2.2	2.28	2.62	3.1	3.47	3.7	3.9	4	3.64	3.33	2.27	2.2	2.44	2.65	2.78
m AHD	26.34	26.09	26.00	25.944	26.014	26.24	26.67	27.73	27.65	27.52	27.44	27.10	26.62	26.25	26.02	25.82	25.72	26.08	26.39	27.45	27.52	27.28	27.07	26.94
Purge	96	92	90	90	91	94	101	116	115	113	112	107	99	95	90	87	86	91	96	45	113	109	115	104
Field pH	5.65	5.43	5.53	5.8	5.75	5.85	5.91	6.07	5.76	5.79	5.85	6.02	5.85	5.81	5.76	5.82	6.05	5.91	6.03	6.56	6	5.79	5.76	5.83
Temp	17.4	15.9	22.1	17.7	18.9	17.2	17.4	16	18.4	16.7	17.9	22.3	19.1	19	19.1	20.6	17.3	17.9	18.3	18.4	16.8	19.1	19.8	20.1
Field Cond (EC)	1740.00	1710.00	1770.00	1650.00	1640.00	1560.00	1530.00	1560.00	1790.00	1650.00	1690.00	1520.00	1510.00	1350.00	1570.00	1490.00	1520.00	1260.00	1340.00	1130.00	1130.00	1250.00	1240.00	1260.00
Field Salinity	870	850	890	830	820	780	770	780	900	830	850	760	750	680	780	740	780	630	680	570	570	630	610	670
Field ROP	400	449	413	516	445	426	440	351	358	408	398	439	392	382	280	362	354	319	355	362	367	390	380	370
Field Alkalinity	63	60	72	72	93	90	81	66	69	54	45	72	60	87	63	65	63	60	63	54	60	60	36	45
Field TTA	190.000	160	200	190	190	185	170	160	180	135	135	127	130	140	155	200	170	160	180	170	180	165	180	170
Field DO %S	16.8	14.1	16.5	15.6	15.1																			
Comments																								
Aluminium Filtered (Al)	0.007	0.014	0.014	0.019	0.005	<0.005	0.03	0.012	0.022	0.013	0.01	0.014	0.011	0.015	0.017	0.013	0.019	0.012	0.022	0.021	0.021	0.017	0.012	0.014
Aluminium Total (Al)																		0.023			0.024			
Arsenic (As)																		<0.0001			<0.0001			
Arsenic (As) Total																		<0.0001			<0.0001			
Boron (B)																								
Cadmium (Cd)																		<0.0001			<0.0001			
Cadmium (Cd) Total																		<0.0001			<0.0001			
Calcium (Ca)																								
Chromium (Cr)																		<0.0001			0.0001			
Chromium (Cr) Total																		<0.0001			0.0002			
Chromium VI (Cr)																		<0.004			<0.004			
Chromium VI (Cr) Total																		<0.004			<0.0001			
Cobolt (Co)																		0.0023			0.0022			
Cobolt (Co) Total																		0.0021			0.0022			
Copper (Cu)																		<0.0001			<0.0001			
Copper (Cu) Total																		0.0003			0.0006			
Iron Filtered (Fe)	9.500	13	11	16	16	17	21	26	15	11	10	9.9	8.2	10	10	12	12	12	15	16	15	10	8.3	7.2
Iron Total (Fe)																		12			15			
Lead (Pb)																		<0.0001			<0.0001			
Manganese (Mn)	0.028	0.035	0.038	0.038	0.035	0.033	0.035	0.039	0.043	0.037	0.032	0.03	0.032	0.028	0.052	0.029	0.028	0.036	0.029	0.028	0.035	0.14	0.023	0.023
Magnesium (Mg)	71.1	88	88.1	77	73.2							69.2	59.6	60.4	59	55.2	59.8	54	59.7	53.1	54.9	57.4	57	59.7
Mercury (Hg)																		<0.00005			<0.00005			
Mercury (Hg) Total																		<0.00005			<0.00005			
Molybdenum (Mo)																								
Nickel (Ni)																		<0.0005			<0.0005			
Nickel (Ni) Total																		<0.0005			<0.0005			
Selenium (Se)																		<0.0002			<0.0002			
Selenium (Se) Total																		<0.0002			<0.0002			
Uranium (U)																		<0.0001			<0.0001			
Uranium (U) Total																		<0.0001			<0.0001			
Zinc (Zn)																		0.002			0.002			
Zinc (Zn) Total																		0.007			<0.005			
Thallium (Tl)																		<0.0001			<0.0001			
Thallium (Tl) Total																		<0.0001			<0.0001			
CaCO3 (Acidity)	120	120	140	120	120	110	110	81	130	110	110	180	96	61	89	110	47	96	130	82	50	92	100	31
CaCO3 (Alkalinity)	46	81	53	36	36	41	76	74	50	46	47	42	56	59	43	47	47	70	68	59	50	29	47	51
Bicarbonate	46	81	53	36	36							42	56	59	43	47	47	70	68	59	50	29	47	51
Calcium	22.1	28.8	27.7	25.9	26.1							22.9	19.6	21	19.6	19.3	20.3	19.1	22	20.1	20.3	22	20.9	20.1
Carbonate																								
Ammonia (NH3-N)																								
Nitrogen Total (N)																								
Chloride (Cl)	392	390	388	344	313	285	248	260	353	329	294	289	245	221	220	196	224	203	169	139	171	214	214	251
NATA EC	1720	1670	1740	1590	1540	1470	1390	1460	1650	1630	1520	1440	1340	1210	1260	1220	1250	1200	1110	1030	1060	762	1180	1200
O2																								
Phosphate as PO4-P																								
Phosphorus Total (P)																								
NATA pH	5.9	6	6	5.8	5.7	5.9	6.2	6	6.4	6.2	5.9	6.2	6	6.2	6.1	6.4	6.2	6	6.1	6.3	11	5.9	6.6	6.8
Potassium (K)	16.7	16.1	17.5	16.2								14.5	13.9	15.8	13.8	13.9	14.8	14.2	16.1	15.7	16.4	15.7	14.5	14.9
Sodium (Na)	168	174	165	155	137	144	145	160	153	147		136	131	127	124	123	133	117	131	113	119	116	114	131
Sulphate (SO_4^{2-})	210	220	210	230	250	270	240	220	220	220		220	220	230	230	240	230	220	230	240	210	220	210	200
TDS	990	1100	990	860	920	900	820	960	820	760		780	700	710	620	620	650	650	580	580	600	680	660	670
Eh																		515			423			
Radium 226																		0.04			0.02			
Radium 228																		<0.08			<0.08			
Acrylamide																								
Sulphate:Chloride Ratio	0.54	0.56	0.54	0.67	0.80	0.95	0.97	0.85	0.62	0.67		0.76	0.90	1.04	1.05	1.22	1.03	1.08	1.36	1.73	1.23	1.03	0.98	0.80
Chloride:Sulphate Ratio	1.87	1.77	1.85	1.50	1.25	1.06	1.03	1.18	1.60	1.50		1.31	1.11	0.96	0.96	0.82	0.97	0.92	0.73	0.58	0.81	0.97	1.02	1.26

BOARMAN'S DEFUNCT BORE--- 190m ENE of gate on MCGIBBONS TRACK. Trinagle concrete pad from old mill stand.
Can get camera down this bore.

20005254		Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17
Date						21/06/2017	29/06/2017	26/07/2017	28/08/2017	21/09/2017	23/10/2017	13/10/2017	13/12/2017
Casing Height above topo	m	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Depth of bore	m	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00
SWL (m)	m (from top of casing)					1.2	1.14	0.67			0.31	0.59	0.9
m AHD						28.73	28.79	29.26			29.62	29.34	29.03
Purge	L					dip only	492	506			517	509	499
pH							5.85	5.98			5.74	6.04	5.82
Temp	degrees C						17.6	17.3			18.7	19.1	19.6
Cond (EC)	uS/cm						1340	1380			1600	1450	1530
Salinity	ppm						670	670			800	730	770
ROP mv (Field)							0	25			109	117	158
Alkalinity (Field)											90	87	84
TTA											265	265	279
Do %S								15.5			12.5	11.4	10.4
Comments													
Al (filtered)	mg/L						0.064	0.061			0.043	0.038	0.042
Al(Total)	mg/L						0.24						0.068
As	mg/L						0.0003						0.0002
B	mg/L												
Cd	mg/L						<0.0001						<0.0001
Ca	mg/L												
Cr	mg/L						<0.0001						<0.0001
Co	mg/L												
Cu	mg/L												
Fe (Filtered)	mg/L						29	26			24	22	24
Fe (Total)	mg/L						43						26
Pb	mg/L												
Mn	mg/L						0.60	0.59			0.72	0.68	0.67
Mg	mg/L							21.5			25.1	24.6	
Mercury	mg/L												
Molybdenum	mg/L												
Ni	mg/L						0.0036						0.0050
Se	mg/L						<0.0002						<0.0002
U	mg/L												
Zn	mg/L						0.015						0.032
Fl as F													
CaCO3 (Acidity)	mg/L						150	150			180	100	150
CaCO3 (Alkalinity)	mg/L						91	85			76	35	77
Bicarbonate								85			76	35	
Calcium								3.3			3.7	3.6	
Carbonate								<1			<1	<1	
NH3-N	mg/L						0.36						0.068
Total Nitrogen							1.1						0.16
Cl	mg/L						330	340			360	360	370
EC	uS/cm						1300	1300			1380	1410	1400
O2	mg/L						2.3						2.6
Phosphate as PO4-P	mg/L						<0.005						<0.005
Total Phosphorus							0.29						0.14
pH Lab							6.3	6.2			6	5.8	6
Potassium								7.4			7.7	7.3	
Sodium								181			154	210	
Sulphate	mg/L						40	34			36	31	37
TDS	mg/L						690	700			690	750	700
N	mg/L												
Phos	mg/L												

20005254		Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
Date		11/01/2018	12/02/2018	12/03/2018	12/04/2018	8/05/2018	12/06/2018	10/07/2018	8/08/2018	10/09/2018	10/10/2018	7/11/2018	6/12/2018
Casing Height above topo	m	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Depth of bore	m	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00
SWL (m)	m (from top of casing)	1.05	1.12	1.21	1.27	1.27	0.41	0			0.2	0.49	0.8
m AHD		28.88	28.81	28.72	28.66	28.66	29.52	29.93			29.73	29.44	29.13
Purge	L	494	492	489	488	488	514						502
pH		5.82	5.89	5.84	5.7	5.75	5.78						5.57
Temp	degrees C	17	17.8	18.4	17.9	15.6	15.9						18.3
Cond (EC)	uS/cm	1560	1390	1360	1360	1330	1380						1370
Salinity	ppm	780	690	680	680	670	690						680
ROP mv (Field)		167	195	270	235	285	321						239
Alkalinity (Field)		90	96	135	105	87	93						75
TTA		245	228	275	165	200	200						210
Do %S		10	9.8	12.5	10.3	13.3	13.1						17.7
Comments								Dip Only	No Access	No Access	Dip Only	Dip Only	
Al (filtered)	mg/L	0.055	0.024	0.027	0.027	0.024	0.024						0.037
Al(Total)	mg/L			0.035			20						
As	mg/L			0.0003			0.0003						
B	mg/L												
Cd	mg/L			<0.0001			<0.0001						
Ca	mg/L												
Cr	mg/L			<0.0001			<0.0001						
Co	mg/L												
Cu	mg/L												
Fe (Filtered)	mg/L	27	20	22	26	23	22						22
Fe (Total)	mg/L			27			25						
Pb	mg/L												
Mn	mg/L	0.62	0.50	0.53	0.58	0.56	0.53						0.064
Mg	mg/L	22.5	20.8		22.2	21							22.8
Mercury	mg/L												
Molybdenum	mg/L												
Ni	mg/L			0.0035			0.004						
Se	mg/L			<0.0002			<0.0002						
U	mg/L												
Zn	mg/L			0.015			0.015						
Fl as F													
CaCO3 (Acidity)	mg/L	180	130	160	150	130	130						170
CaCO3 (Alkalinity)	mg/L	86	88	88	70	83	78						82
Bicarbonate		86	88		70	83							82
Calcium		3.2	2.9		3.3	3							3.3
Carbonate													
NH3-N	mg/L			0.30			0.13						
Total Nitrogen				0.28			0.21						
Cl	mg/L	390	320	290	320	320	320						333
EC	uS/cm	1320	1290	1260	1240	1260	1230						1250
O2	mg/L			2.7			3.5						
Phosphate as PO4-P	mg/L			0.020			0.012						
Total Phosphorus				0.024			0.054						
pH Lab		6.1	6.1	6.1	5.9	6.1	6.1						6.1
Potassium		6.6	6.2		7.8	6.6							7.6
Sodium		192	178		193	179							183
Sulphate	mg/L	43	41	33	33	33	32						32
TDS	mg/L	706	668	654	584	664	618						660
N	mg/L												
Phos	mg/L												

20005254		Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
Date		9/01/2019	7/02/2019	12/03/2019	9/04/2019	7/05/2019	10/06/2019	9/07/2019	12/08/2019	10/09/2019	8/10/2019	7/11/2019	10/12/2019
Casing Height above topo	m	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Depth of bore	m	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00
SWL (m)	m (from top of casing)	1.04	1.2	1.31	1.37	1.35	1.22	0.32	0.43		0.52	0.79	1.08
m AHD		28.89	28.73	28.62	28.56	28.58	28.71	29.61	29.50		29.41	29.14	28.85
Purge	L			486			757						764
pH				5.89			5.83						5.78
Temp	degrees C			17.7			16.6						20.4
Cond (EC)	uS/cm			1490			1400						1460
Salinity	ppm			750			700						730
ROP mv (Field)				127			316						344
Alkalinity (Field)				96			87						105
TTA				215			220						210
Do %S				17.3			12.6						18.3
Comments		Dip Only	Dip Only		Dip Only	Dip Only		Dip Only	Dip Only	No Access	Dip Only	Dip Only	
Al (filtered)	mg/L			0.030			0.034						0.022
Al(Total)	mg/L						0.11						
As	mg/L						0.0003						
B	mg/L												
Cd	mg/L						<0.0001						
Ca	mg/L												
Cr	mg/L						0.0001						
Co	mg/L												
Cu	mg/L												
Fe (Filtered)	mg/L			27			20						19
Fe (Total)	mg/L						27						
Pb	mg/L												
Mn	mg/L			0.58			0.53						0.47
Mg	mg/L			22									17.3
Mercury	mg/L												
Molybdenum	mg/L												
Ni	mg/L						0.0051						
Se	mg/L						<0.0002						
U	mg/L												
Zn	mg/L						0.021						
Fl as F													
CaCO3 (Acidity)	mg/L			89			170						150
CaCO3 (Alkalinity)	mg/L			69			79						76
Bicarbonate				69									76
Calcium				3.3									2.7
Carbonate													
NH3-N	mg/L						0.11						
Total Nitrogen							0.16						
Cl	mg/L			337			348						313
EC	uS/cm			1300			1310						1200
O2	mg/L						3.2						
Phosphate as PO4-P	mg/L												
Total Phosphorus							0.051						
pH Lab				6.4			6.2						6.2
Potassium				7.5									6.8
Sodium				188									161
Sulphate	mg/L			36			35						33
TDS	mg/L			730			700						600
N	mg/L												
Phos	mg/L												

20005254		Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Date		9/01/2020	10/02/2020	9/03/2020		11/05/2020	8/06/2020	8/07/2020	6/08/2020	7/09/2020	12/10/2020	5/11/2020	7/12/2020
Casing Height above topo	m	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Depth of bore	m	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00
SWL (m)	m (from top of casing)	1.23	1.36	1.41		1.22	1.06	0.65	0.25	0	0.45	0.67	0.77
m AHD		28.70	28.57	28.52		28.71	28.87	29.28	29.68	29.93	29.48	29.26	29.16
Purge	L			374			383						390
pH				5.69			5.62						5.89
Temp	degrees C			17.9			19.1						19.1
Cond (EC)	uS/cm			1220			1190						1200
Salinity	ppm			610			590						600
ROP mv (Field)				365			396						403
Alkalinity (Field)				102			90						111
TTA				235			230						235
Do %S				4.8			10.5						11.4
Comments		Dip Only	Dip Only			Dip Only		Dip Only	Dip Only	No Access	Dip Only	Dip Only	
Al (filtered)	mg/L			0.036			0.021						0.019
Al(Total)	mg/L						0.12						
As	mg/L						0.0004						
B	mg/L												
Cd	mg/L						<0.0001						
Ca	mg/L												
Cr	mg/L						<0.0001						
Co	mg/L												
Cu	mg/L												
Fe (Filtered)	mg/L			28			25						30
Fe (Total)	mg/L						35						
Pb	mg/L												
Mn	mg/L			0.61			0.49						0.55
Mg	mg/L			21.8									19.3
Mercury	mg/L												
Molybdenum	mg/L												
Ni	mg/L						0.0041						
Se	mg/L						<0.0002						
U	mg/L												
Zn	mg/L						0.017						
Fl as F													
CaCO3 (Acidity)	mg/L			170			150						110
CaCO3 (Alkalinity)	mg/L			81			85						49
Bicarbonate				81									49
Calcium				3.4									3.3
Carbonate													
NH3-N	mg/L						0.21						
Total Nitrogen							0.26						
Cl	mg/L			299			298						295
EC	uS/cm			1150			1170						1100
O2	mg/L						3						
Phosphate as PO4-P	mg/L						<0.005						
Total Phosphorus							0.10						
pH Lab				6.1			6.2						5.9
Potassium				7.7									7.2
Sodium				195									156
Sulphate	mg/L			30			31						31
TDS	mg/L			600			630						510
N	mg/L												
Phos	mg/L												

20005254		Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
Date		13/01/2021	4/02/2021	18/03/2021	1/04/2021	5/05/2021	3/06/2021	6/07/2021	9/08/2021	13/09/2021	14/10/2021	10/11/2021	14/12/2021
Casing Height above topo	m	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Depth of bore	m	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00
SWL (m)	m (from top of casing)	1.1	1.23	1.22	1.31	1.03	0.8	0.49			0	0.35	0.75
m AHD		28.83	28.70	28.71	28.62	28.90	29.13	29.44			29.93	29.58	29.18
Purge	L			379			389						390
pH				5.71			6						5.94
Temp	degrees C			17.9			17.6						18.2
Cond (EC)	uS/cm			1290			1300						1400
Salinity	ppm			640			650						700
ROP mv (Field)				412			412						
Alkalinity (Field)				105			114						111
TTA				227			240						210
Do %S				8.9									
Comments		Dip Only	Dip Only		Dip Only	Dip Only		Dip Only	No access	No access	Dip Only	Dip Only	
Al (filtered)	mg/L			0.042			0.019						0.026
Al(Total)	mg/L												
As	mg/L												
B	mg/L												
Cd	mg/L												
Ca	mg/L												
Cr	mg/L												
Co	mg/L												
Cu	mg/L												
Fe (Filtered)	mg/L			43			38						27
Fe (Total)	mg/L												
Pb	mg/L												
Mn	mg/L			0.59			0.58						0.68
Mg	mg/L			21.2									23
Mercury	mg/L												
Molybdenum	mg/L												
Ni	mg/L												
Se	mg/L												
U	mg/L												
Zn	mg/L												
Fl as F													
CaCO3 (Acidity)	mg/L			130			130						160
CaCO3 (Alkalinity)	mg/L			46			45						93
Bicarbonate				46									93
Calcium				3.7									3.7
Carbonate													
NH3-N	mg/L												
Total Nitrogen													
Cl	mg/L			294			308						336
EC	uS/cm			1120			1150						1270
O2	mg/L												
Phosphate as PO4-P	mg/L												
Total Phosphorus													
pH Lab				5.8			5.9						6
Potassium				8.6									9
Sodium				176			170						189
Sulphate	mg/L			28			31						31
TDS	mg/L			620			630						620
N	mg/L												
Phos	mg/L												

20005254		Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Oct-22	Nov-22	Dec-22
Date		11/01/2022	15/02/2022	9/03/2022	6/04/2022	12/05/2022	30/06/2022	9/08/2022	9/08/2022	14/09/2022	12/10/2022	20/10/2022	17/11/2022	15/12/2022
Casing Height above topo	m	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Depth of bore	m	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00
SWL (m)	m (from top of casing)	1.04	1.15	1.36	1.42	1.43	0.92	0.1	0.1	0.44		0.5	0.5	1
m AHD				28.57			29.01			29.49			29.43	28.93
Purge	L			370			386			397			396	360
pH				6.02			5.9			5.96			6	5.86
Temp	degrees C			20.5			14			16.7			18.2	18.6
Cond (EC)	uS/cm			1570			1480			1390			1360	1350
Salinity	ppm			780			750			680			680	680
ROP mv (Field)				334			317			251			310	305
Alkalinity (Field)				75			117			75			72	72
TTA				240			260			210			200	190
Do %S														
Comments		Dip Only	Dip Only		Dip Only	Dip Only		Dip Only	Dip Only			Dip Only		
Al (filtered)	mg/L			0.029			0.03				0.009		0.032	
Al(Total)	mg/L													0.038
As	mg/L													
B	mg/L													
Cd	mg/L													
Ca	mg/L													
Cr	mg/L													
Co	mg/L													
Cu	mg/L													
Fe (Filtered)	mg/L			30			34				0.1		27	32
Fe (Total)	mg/L													
Pb	mg/L													
Mn	mg/L			0.67			0.62				0.87		0.68	0.65
Mg	mg/L			22.6			21.5				17.9		24	22
Mercury	mg/L													
Molybdenum	mg/L													
Ni	mg/L													
Se	mg/L													
U	mg/L													
Zn	mg/L													
Fl as F														
CaCO3 (Acidity)	mg/L			150			130				110		100	98
CaCO3 (Alkalinity)	mg/L			98			44				44		65	91
Bicarbonate				98			44				44		65	91
Calcium				3.7			3.6				3.6		3.9	3.4
Carbonate														
NH3-N	mg/L													
Total Nitrogen														
Cl	mg/L			332			360				349		331	335
EC	uS/cm			1300			1190				1260		1370	1290
O2	mg/L													
Phosphate as PO4-P	mg/L													
Total Phosphorus														
pH Lab				6.3			5.9				6		6.4	6.2
Potassium				8.5			7.6				9.1		8.8	8.5
Sodium				189			198				83.2		218	195
Sulphate	mg/L			31			33				34		33	32
TDS	mg/L			610			580				660		640	630
N	mg/L													
Phos	mg/L													

BORE DRILLED NOV 1996. 16.5M.VERIFIED LOCATION-SERVICE OLD BRAND DAIRY

Mcleay Defunct Dairy - Can get camera down.

20005356		Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17
Date						31/05/2017	27/06/2017	27/07/2017	16/08/2017	21/09/2017	19/10/2017	16/11/2017	18/12/2017
Casing Height above topo	m	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Depth of bore	m	16.50	16.50	16.50	16.50	16.50	16.50	16.50	16.50	16.50	16.50	16.50	16.50
SWL (m)	m (from top of casing)					2.9	2.75	2.23	1.06	1.28	1.48	1.91	2.32
m AHD						20.89	21.04	21.56	22.73	22.51	22.31	21.88	21.47
Purge	L						426	442	479	426	466	452	440
pH							5.74	5.8	5.68	5.54	5.24	5.38	5.43
Temp	degrees C						18.6	16.2	17.6	18.2	18.1	19.6	18.8
Cond (EC)	uS/cm						1760	1750	1850	2030	2030	1940	1970
Salinity	ppm						880	880	930	1010	1020	970	990
ROP mv (Field)							82	22	108	233	342	311	249
Alkalinity (Field)											33	45	45
TTA											184	182	145
Do %S								13.4	11.2	11.7	11.3	11	10.8
Comments						Dip only							
Al (filtered)	mg/L						0.032	0.032	0.023	0.034	0.024	0.013	0.017
Al(Total)	mg/L						1.7			0.074			0.33
As	mg/L						<0.0001			0.0003			0.0001
B	mg/L												
Cd	mg/L						<0.0001			<0.0001			<0.0001
Ca	mg/L												
Cr	mg/L						0.0001			0.0001			<0.0001
Co	mg/L												
Cu	mg/L												
Fe (Filtered)	mg/L						15	15	11	4.7	4.9	4.6	5.8
Fe (Total)	mg/L						360			10			100
Pb	mg/L												
Mn	mg/L						0.46	0.46	0.52	0.55	0.55	0.53	0.60
Mg	mg/L							36.7	41.5		53.5	49.4	
Mercury	mg/L												
Molybdenum	mg/L												
Ni	mg/L						0.0068			0.0075			0.0069
Se	mg/L						<0.0002			<0.0002			<0.0002
U	mg/L												
Zn	mg/L						0.025			0.068			0.092
Fl as F													
$CaCO_3$ (Acidity)	mg/L						170	49	99	45	76	89	100
$CaCO_3$ (Alkalinity)	mg/L						51	33	56	25	25	17	21
Bicarbonate								33	56		25	17	
Calcium								8.4	9.8		14.4	13	
Carbonate								>1	<1		<1	<1	
NH_3-N	mg/L						0.15			0.039			0.031
Total Nitrogen							0.78			1.1			2.6
Cl	mg/L						460	460	470	500	500	500	490
EC	uS/cm						1680	1650	1670	1800	1830	1800	1810
O_2	mg/L						2.8			3.2			2.7
Phosphate as PO_4-P	mg/L						<0.005			<0.005			0.009
Total Phosphorus							1.4			0.19			2.4
pH Lab							6	6.1	5.9	5.9	5.7	5.5	5.5
Potassium								10.6	12.6		16.4	13.9	
Sodium								225	173		171	229	
Sulphate	mg/L						66	58	75	120	120	120	120
TDS	mg/L						900	890	870	1000	1100	1000	986
N	mg/L												
Phos	mg/L												

20005356		Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
Date		17/01/2018	15/02/2018	15/03/2018	18/04/2018	14/05/2018	18/06/2018	11/07/2018	13/08/2018	12/09/2018	10/10/2018	12/11/2018	11/12/2018
Casing Height above topo	m	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Depth of bore	m	16.50	16.50	16.50	16.50	16.50	16.50	16.50	16.50	16.50	16.50	16.50	16.50
SWL (m)	m (from top of casing)	2.55	2.78	2.97	3.1	3.11	2.19	1.64	0.87	0.95	1.44	1.85	2.2
m AHD		21.24	21.01	20.82	20.69	20.68	21.60	22.15	22.92	22.84	22.35	21.94	21.59
Purge	L	432	425	419	415	415	444			482			443
pH		5.22	5.35	5.35	5.2	5.25	5.48			5.54			5.09
Temp	degrees C	20	18.3	19.1	17.7	18.2	16.3			16.8			19.7
Cond (EC)	uS/cm	2100	1920	1970	1950	1880	1870			2130			2080
Salinity	ppm	1050	960	980	970	940	940			1060			1040
ROP mv (Field)		312	305	332	341	377	402			152			287
Alkalinity (Field)		39	45	75	30	33	45			39			33
TTA		140	150	170	185	200	170			165			185
Do %S		10.1	10.1	8.6		18.4	14.8			14.8			15.2
Comments								Dip Only	Dip Only		Dip Only	Dip Only	
Al (filtered)	mg/L	0.011	0.009	0.010	<0.005	0.014	0.012			0.009			0.018
Al(Total)	mg/L			0.085			0.24						
As	mg/L			<0.0001			<0.0001						
B	mg/L												
Cd	mg/L			<0.0001			<0.0001						
Ca	mg/L												
Cr	mg/L			0.0001			<0.0001						
Co	mg/L												
Cu	mg/L												
Fe (Filtered)	mg/L	2.5	2.6	3.2	1	6.1	5.2			3.1			3.3
Fe (Total)	mg/L			24			37						
Pb	mg/L												
Mn	mg/L	0.49	0.48	0.50	0.59	0.57	0.45			0.53			0.57
Mg	mg/L	51.4	47.8		56.1	50				54.8			61.2
Mercury	mg/L												
Molybdenum	mg/L												
Ni	mg/L			0.0074			0.01						
Se	mg/L			<0.0002			<0.0002						
U	mg/L												
Zn	mg/L			0.071			0.073						
Fl as F													
$CaCO_3$ (Acidity)	mg/L	110	120	110	81	130	160			100			75
$CaCO_3$ (Alkalinity)	mg/L	24	18	19	22	26	32			21			23
Bicarbonate		24	18		22	26				21			23
Calcium		13.9	13		15.9	14.9				17.7			18.8
Carbonate													
NH_3-N	mg/L			0.041			0.072						
Total Nitrogen				1.1			0.51						
Cl	mg/L	480	480	470	500	480	470			490			515
EC	uS/cm	1860	1820	1820	1840	1760	1690			1880			1910
O_2	mg/L			2.8			3.9						
Phosphate as PO_4-P	mg/L			<0.005			<0.005						
Total Phosphorus				0.42			0.59						
pH Lab		5.6	5.4	5.5	5.5	5.6	5.6			5.6			5.7
Potassium		15.4	14.6		17.5	15				18.2			19.7
Sodium		217	221		259	241				252			268
Sulphate	mg/L	140	120	130	120	97	83			130			140
TDS	mg/L	1040	1070	1010	986	969	911			1010			980
N	mg/L												
Phos	mg/L												

20005356		Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
Date		14/01/2019	11/02/2019	13/03/2019	10/04/2019	8/05/2019	13/06/2019	11/07/2019	9/08/2019	10/09/2019	9/10/2019	12/11/2019	11/12/2019
Casing Height above topo	m	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Depth of bore	m	16.50	16.50	16.50	16.50	16.50	16.50	16.50	16.50	16.50	16.50	16.50	16.50
SWL (m)	m (from top of casing)	2.63	2.88	3.02	3.17	3.19	2.95	2.18	1.99	1.65	1.85	2.2	2.59
m AHD		21.16	20.91	20.77	20.62	20.60	20.84	21.61	21.80	22.14	21.94	21.59	21.20
Purge	L			418			420			460			431
pH				5.25			5.45			5.72			5.49
Temp	degrees C			18.6			16.4			15.5			19.1
Cond (EC)	uS/cm			2110			1850			1830			2190
Salinity	ppm			1060			920			920			1090
ROP mv (Field)				274			252			346			417
Alkalinity (Field)				39			39			36			51
TTA				175			130			170			140
Do %S				13			14.7			16.5			19.9
Comments		Dip Only	Dip Only		Dip Only	Dip Only		Dip Only	Dip Only		Dip Only	Dip Only	
Al (filtered)	mg/L			0.013			0.012			0.017			0.008
Al(Total)	mg/L						0.72						
As	mg/L						<0.0001						
B	mg/L												
Cd	mg/L						0.0001						
Ca	mg/L												
Cr	mg/L						<0.0001						
Co	mg/L												
Cu	mg/L												
Fe (Filtered)	mg/L			2.6			3.7			11			4.4
Fe (Total)	mg/L						100						
Pb	mg/L												
Mn	mg/L			0.50			0.43			0.042			0.46
Mg	mg/L			56.4						41			48.4
Mercury	mg/L												
Molybdenum	mg/L												
Ni	mg/L						0.014						
Se	mg/L						<0.0002						
U	mg/L												
Zn	mg/L						0.11						
Fl as F													
$CaCO_3$ (Acidity)	mg/L			56			110			81			100
$CaCO_3$ (Alkalinity)	mg/L			22			24			23			27
Bicarbonate				22						23			27
Calcium				18.6						12.1			13.9
Carbonate													
NH_3-N	mg/L						0.050						
Total Nitrogen							0.74						
Cl	mg/L			521			480			461			525
EC	uS/cm			1910			1730			1670			1850
O_2	mg/L						4.5						
Phosphate as PO_4-P	mg/L												
Total Phosphorus							1.8						
pH Lab				5.9			5.9			5.8			5.8
Potassium				19.8						14.9			15.6
Sodium				247						249			245
Sulphate	mg/L			170			100			70			100
TDS	mg/L			1100			1000			910			980
N	mg/L												
Phos	mg/L												

20005356		Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Date		9/01/2020	10/02/2020	10/03/2020	1/04/2020	11/05/2020	10/06/2020	10/07/2020	7/08/2020	10/09/2020	14/10/2020	10/11/2020	10/12/2020
Casing Height above topo	m	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Depth of bore	m	16.50	16.50	16.50	16.50	16.50	16.50	16.50	16.50	16.50	16.50	16.50	16.50
SWL (m)	m (from top of casing)	2.87	3.08	3.17	3.29	3.13	2.9	2.41	1.75	1.34	1.69	1.99	2.23
m AHD		20.92	20.71	20.62	20.50	20.66	20.89	21.38	22.04	22.45	22.10	21.80	21.56
Purge	L			317			326			364			342
pH				5.25			5.57			5.6			5.25
Temp	degrees C			18.7			17.3			16			20.3
Cond (EC)	uS/cm			1800			1670			1750			2100
Salinity	ppm			900			840			870			1050
ROP mv (Field)				382			335			348			372
Alkalinity (Field)				39			45			60			33
TTA				150			170			140			155
Do %S				11.4			15.7			20.2			20.9
Comments		Dip Only	Dip Only		Dip Only	Dip Only		Dip Only	Dip Only		Dip Only	Dip Only	
Al (filtered)	mg/L			0.014			0.011			0.11			0.010
Al(Total)	mg/L						0.045						
As	mg/L						0.0001						
B	mg/L												
Cd	mg/L						<0.0001						
Ca	mg/L												
Cr	mg/L						0.0003						
Co	mg/L												
Cu	mg/L												
Fe (Filtered)	mg/L			4			5.7			6.8			3.6
Fe (Total)	mg/L						8						
Pb	mg/L												
Mn	mg/L			0.50			0.054			0.49			0.62
Mg	mg/L			42.9						42.3			58.9
Mercury	mg/L												
Molybdenum	mg/L												
Ni	mg/L						0.011						
Se	mg/L						<0.0002						
U	mg/L												
Zn	mg/L						0.11						
Fl as F													
$CaCO_3$ (Acidity)	mg/L			110			82			130			77
$CaCO_3$ (Alkalinity)	mg/L			24			31			42			27
Bicarbonate				24						42			27
Calcium				12.1						12.3			18.9
Carbonate													
NH_3-N	mg/L						0.072						
Total Nitrogen							0.19						
Cl	mg/L			518			467			491			552
EC	uS/cm			1730			1630			1710			1960
O_2	mg/L						4						
Phosphate as PO_4-P	mg/L												
Total Phosphorus							0.044						
pH Lab				5.7			6			5.8			5.6
Potassium				13.2						13.3			16.8
Sodium				229						244			255
Sulphate	mg/L			95			71			73			140
TDS	mg/L			980			780			660			1100
N	mg/L												
Phos	mg/L												

20005356		Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
Date		15/01/2021	10/02/2021	17/03/2021	1/04/2021	5/05/2021	10/06/2021	6/07/2021	10/08/2021	6/09/2021	14/10/2021	11/11/2021	14/12/2021
Casing Height above topo	m	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Depth of bore	m	16.50	16.50	16.50	16.50	16.50	16.50	16.50	16.50	16.50	16.50	16.50	16.50
SWL (m)	m (from top of casing)	2.79	2.96	3.1	3.21	2.97	2.6	2.24	1.03	1.2	1.24	1.39	2.09
m AHD		21.00	20.83	20.69	20.58	20.82	21.19	21.55	22.76	22.59	22.55	22.40	21.70
Purge	L			322			334			367			346
pH				4.99			5.45			5.37			5.27
Temp	degrees C			18.4			18.8			16.7			18.3
Cond (EC)	uS/cm			2080			1950			2250			2340
Salinity	ppm			1040			960			1130			1170
ROP mv (Field)				397			402			365			
Alkalinity (Field)				30			36			60			90
TTA				152			150			150			138
Do %S				9.8									
Comments		Dip Only	Dip Only		Dip Only	Dip Only		Dip Only	Dip Only		Dip Only	Dip Only	
Al (filtered)	mg/L			0.023			0.012			0.034			0.074
Al(Total)	mg/L												
As	mg/L												
B	mg/L												
Cd	mg/L												
Ca	mg/L												
Cr	mg/L												
Co	mg/L												
Cu	mg/L												
Fe (Filtered)	mg/L			3.8			4.9			2.1			5.6
Fe (Total)	mg/L												
Pb	mg/L												
Mn	mg/L			0.70			0.52			0.58			0.7
Mg	mg/L			64.2									70.3
Mercury	mg/L												
Molybdenum	mg/L												
Ni	mg/L												
Se	mg/L												
U	mg/L												
Zn	mg/L												
Fl as F													
$CaCO_3$ (Acidity)	mg/L			98			89			87			120
$CaCO_3$ (Alkalinity)	mg/L			13			17			14			16
Bicarbonate				13									16
Calcium													22.4
Carbonate													
NH_3-N	mg/L												
Total Nitrogen													
Cl	mg/L			549			512			569			604
EC	uS/cm			2070			1730			2140			2200
O_2	mg/L												
Phosphate as PO_4-P	mg/L												
Total Phosphorus													
pH Lab				5.3			5.8			5.9			5.4
Potassium				17.5									27.5
Sodium				276			253			281			287
Sulphate	mg/L			120			83			130			140
TDS	mg/L			1100			930			1200			1000
N	mg/L												
Phos	mg/L												

20005356		Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
Date		6/01/2021	3/02/2022	8/03/2022	19/04/2022	18/05/2022	22/06/2022	26/07/2022	25/08/2022	28/09/2022	20/10/2022	22/11/2022	14/12/2022
Casing Height above topo	m	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Depth of bore	m	16.50	16.50	16.50	16.50	16.50	16.50	16.50	16.50	16.50	16.50	16.50	16.50
SWL (m)	m (from top of casing)	2.45	2.45	2.83	2.83	2.83	0	2.22	1.24	1.24	1.3	1.42	2.27
m AHD		21.34	21.34	20.96	20.96	20.96	23.79	21.57	22.55	22.55	22.49	22.37	21.52
Purge	L							342		360			340
pH								5.53		5.34			5.78
Temp	degrees C							18.2		18.2			20.1
Cond (EC)	uS/cm							1890		2390			2420
Salinity	ppm							950		1190			1210
ROP mv (Field)								283		358			245
Alkalinity (Field)								45		30			60
TTA								200		150			170
Do %S													
Comments		Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only		Dip Only		Dip Only	Dip Only	
Al (filtered)	mg/L							0.047		0.016			0.026
Al(Total)	mg/L												
As	mg/L												
B	mg/L												
Cd	mg/L												
Ca	mg/L												
Cr	mg/L												
Co	mg/L												
Cu	mg/L												
Fe (Filtered)	mg/L							25		1.7			8.9
Fe (Total)	mg/L												
Pb	mg/L												
Mn	mg/L							0.44		0.69			0.83
Mg	mg/L							41.5		80.2			81.6
Mercury	mg/L												
Molybdenum	mg/L												
Ni	mg/L												
Se	mg/L												
U	mg/L												
Zn	mg/L												
Fl as F													
$CaCO_3$ (Acidity)	mg/L							120		69			62
$CaCO_3$ (Alkalinity)	mg/L							60		15			28
Bicarbonate								60		15			28
Calcium								12.8		28.1			24.6
Carbonate													
NH_3-N	mg/L												
Total Nitrogen													
Cl	mg/L							478		672			667
EC	uS/cm							1710		2410			2390
O_2	mg/L												
Phosphate as PO_4-P	mg/L												
Total Phosphorus													
pH Lab								6.2		5.6			6.3
Potassium								13.8		26.9			20.1
Sodium								266		316			319
Sulphate	mg/L							60		140			140
TDS	mg/L							810		1200			1200
N	mg/L												
Phos	mg/L												

20083645		Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18
Date						31/05/2017	27/06/2017	25/07/2017	15/08/2017	19/09/2017	17/10/2017	14/11/2017	14/12/2017	15/01/2018	13/02/2018	13/03/2018	16/04/2018	9/05/2018	13/06/2018
Casing Height above topo	m	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Depth of bore	m	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00
SWL (m)	m (from top of casing)					0.85	0.76	0.74	0	0	0.17	1.36	0.99	1.18	1.12	1.24	1.29	1.11	0.10
m AHD						19.75	19.84	19.86	20.6	20.6	20.43	19.24	19.61	19.42	19.48	19.36	19.31	19.49	20.5
Purge	L																		
pH							6.03	6.31	6.05	5.88	6.19	6.32	6.14	6.1	6.13	6.14	6.12	6.12	6.1
Temp	degrees C						16.9	15.8	17.4	17.5	17.6	18.8	19.7	20.1	17.7	19.2	17.4	15.9	16.3
Cond (EC)	uS/cm						1400	1380	1430	1460	1500	1380	1530	1520	1400	1410	1410	1410	1420
Salinity	ppm						700	690	720	730	750	690	760	760	700	710	710	700	710
ROP mv (Field)							-27	2	92	121	121	154	147	187	184	187	285	313	375
Alkalinity (Field)										96	99	78	90	90	81	84	87	66	72
TTA										246	165	166	190	130	175	185	188	155	180
Do %S								21.6	19.8	14.4	23.4	20.9	22.9	17	17.9	22.1	19.1	23.1	23.2
Comments																			
Al (filtered)	mg/L						0.068	0.087	0.070	0.009	0.069	0.050	0.081	0.052	0.043	0.042	0.033	0.040	0.035
Al(Total)	mg/L						0.067			0.074			0.080			0.056			0.038
As	mg/L						0.0003			0.0003			0.0003			0.0003			0.0003
B	mg/L																		
Cd	mg/L						<0.0001			<0.0001			<0.0001			<0.0001			<0.0001
Ca	mg/L																		
Cr	mg/L						0.0003			<0.0001			<0.0001			0.0002			<0.0001
Co	mg/L																		
Cu	mg/L																		
Fe (Filtered)	mg/L						34	39	38	37	39	30	42	30	36	35	33	37	30
Fe (Total)	mg/L						39			37			43			43			31
Pb	mg/L																		
Mn	mg/L						0.56	0.61	0.60	0.63	0.61	0.56	0.63	0.50	0.58	0.57	0.54	0.60	0.52
Mg	mg/L							29.5	27.9		28.7	28.1		24.6	28		26.4	30.2	
Mercury	mg/L																		
Molybdenum	mg/L																		
Ni	mg/L						0.011			0.014			0.011			0.011			0.014
Se	mg/L						<0.0002			<0.0002			<0.0002			<0.0002			<0.0002
U	mg/L																		
Zn	mg/L						0.021			0.065			0.006			0.015			0.008
Fl as F																			
CaCO3 (Acidity)	mg/L						120	120	120	110	76	70	87	110	79	120	73	83	88
CaCO3 (Alkalinity)	mg/L						52	53	72	47	58	19	37	51	38	70	40	71	62
Bicarbonate								53	72		58	19		51	38		40	71	
Calcium								11.2	10.3		11	10.6		9.1	10.3		10.1	11.1	
Carbonate								<1	<1		<1	<1							
NH3-N	mg/L						0.058			0.031			0.055			0.055			0.052
Total Nitrogen							0.066			0.069			0.072			0.086			0.14
Cl	mg/L						340	340	340	340	340	330	340	340	380	320	340	350	360
EC	uS/cm						1260	1270	1310	1250	1290	1220	1240	1260	1120	1290	1280	1320	1320
O2	mg/L						5.1			4.3			5.1			4.4			5.4
Phosphate as PO4-P	mg/L						<0.005			<0.005			0.015			0.015			<0.005
Total Phosphorus							0.65			0.79			0.59			0.065			0.90
pH Lab							6.2	6.2	6.4	6	6.3	5.6	6	6	6	6.2	6.1	6.4	6.4
Potassium								11.4	11.2		10.5	10.9		8.3	11		10.7	11	
Sodium								170	131		133	172		146	175		164	175	
Sulphate	mg/L						37	38	39	39	38	35	39	46	42	39	38	39	37
TDS	mg/L						690	690	620	640	680	650	670	694	682	669	578	735	636
N	mg/L																		
Phos	mg/L																		

20083645		Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
Date		11/07/2018	13/08/2018	11/09/2018	10/10/2018	12/11/2018	10/12/2018	14/01/2019	11/02/2019	11/03/2019	10/04/2019	8/05/2019	12/06/2019	12/07/2019	9/08/2019	11/09/2019	9/10/2019	12/11/2019	9/12/2019
Casing Height above topo	m	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Depth of bore	m	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00
SWL (m)	m (from top of casing)	0.80	0.25	0.43	0.24	0.83	4.36	4.6	1.33	1.14	1.24	1.11	0.84	0.5	0.08	0.08	0.22	1.49	1.19
m AHD		19.8	20.35	20.17	20.36	19.77	16.24	16	19.27	19.46	19.36	19.49	19.76	20.1	20.52	20.52	20.38	19.11	19.41
Purge	L																		
pH				6.15			6			6.17			6.15			6.15			6.16
Temp	degrees C			14.7			18.3			17.8			15.3			17.9			18.4
Cond (EC)	uS/cm			1520			1420			1470			1370			1480			1520
Salinity	ppm			760			710			730			690			740			760
ROP mv (Field)				80			131			94			296			323			295
Alkalinity (Field)				90			78			75			87			75			90
TTA				175			175			165			135			145			175
Do %S				24.4			25.5			25.2			20.6			26.7			27.4
Comments		Dip Only	Dip Only		Dip Only	Dip Only		Dip Only	Dip Only		Dip Only	Dip Only		Dip Only	Dip Only		Dip Only	Dip Only	
Al (filtered)	mg/L			0.034			0.040			0.041			0.043			0.036			0.033
Al(Total)	mg/L												0.056						
As	mg/L												0.0004						
B	mg/L																		
Cd	mg/L												<0.0001						
Ca	mg/L																		
Cr	mg/L												0.0001						
Co	mg/L																		
Cu	mg/L																		
Fe (Filtered)	mg/L			35			34			37			33			32			35
Fe (Total)	mg/L												41						
Pb	mg/L																		
Mn	mg/L			0.56			0.55			0.57			0.53			0.53			0.53
Mg	mg/L			26.6			27			28.8						26.2			25.8
Mercury	mg/L																		
Molybdenum	mg/L																		
Ni	mg/L												0.016						
Se	mg/L												<0.0002						
U	mg/L																		
Zn	mg/L												0.021						
Fl as F																			
CaCO3 (Acidity)	mg/L			100			110			68			100			66			120
CaCO3 (Alkalinity)	mg/L			72			59			18			55			42			61
Bicarbonate				72			59			18						42			61
Calcium				10.2			10.1			11.2						10.1			10.1
Carbonate																			
NH3-N	mg/L												0.028						
Total Nitrogen													<0.025						
Cl	mg/L			350			326			339			337			328			342
EC	uS/cm			1310			1300			1210			1300			1260			1300
O2	mg/L												5.3						
Phosphate as PO4-P	mg/L																		
Total Phosphorus													0.93						
pH Lab				6.3			6.2			5.8			6.4			6.2			6.3
Potassium				9.9			10.1			11						10.9			10.9
Sodium				164			162			175						166			160
Sulphate	mg/L			39			39			41			40			37			41
TDS	mg/L			665			770			670			710			630			670
N	mg/L																		
Phos	mg/L																		

20083645		Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21
Date		13/01/2020	10/02/2020	11/03/2020	24/04/2020	11/05/2020	10/06/2020	10/07/2020	7/08/2020	8/09/2020	14/10/2020	10/11/2020	9/12/2020	15/01/2021	10/02/2021	16/03/2021	1/04/2021	5/05/2021	14/06/2021
Casing Height above topo	m	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Depth of bore	m	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00
SWL (m)	m (from top of casing)	1.34	1.5	2.55	1.24	0.91	0.65	0.25	0.03	0.006	0.46	0.56	1.85	1.08	1.8	0.85	0.67	3.94	0.43
m AHD		19.26	19.1	18.05	19.36	19.69	19.95	20.35	20.57	20.594	20.14	20.04	18.75	19.52	18.8	19.75	19.93	16.66	20.17
Purge	L																		
pH				6.19			6.31			6.18			6.23						6.26
Temp	degrees C			18.2			16			15.4			18.5						16.7
Cond (EC)	uS/cm			1340			1320			1320			1340						1400
Salinity	ppm			670			660			660			670						700
ROP mv (Field)				409			304			401			387						398
Alkalinity (Field)				78			87			93			90						96
TTA				160			145			160			170						190
Do %S				20.9			20.6			18.4			32.2						
Comments		Dip Only	Dip Only		Dip Only	Dip Only		Dip Only	Dip Only		Dip Only	Dip Only		Dip Only	Dip Only		Dip Only	Dip Only	
Al (filtered)	mg/L			0.034			0.032			0.039			0.028						0.029
Al(Total)	mg/L						0.049												
As	mg/L						0.0004												
B	mg/L																		
Cd	mg/L						<0.0001												
Ca	mg/L																		
Cr	mg/L						<0.0001												
Co	mg/L																		
Cu	mg/L																		
Fe (Filtered)	mg/L			33			36			36			37						37
Fe (Total)	mg/L						41												
Pb	mg/L																		
Mn	mg/L			0.52			0.54			0.59			0.56						0.58
Mg	mg/L			24.4						27.4			26.5						
Mercury	mg/L																		
Molybdenum	mg/L																		
Ni	mg/L						0.015												
Se	mg/L						<0.0002												
U	mg/L																		
Zn	mg/L						0.012												
Fl as F																			
CaCO3 (Acidity)	mg/L			93			97			130			98						140
CaCO3 (Alkalinity)	mg/L			50			70			74			52						85
Bicarbonate				50						74			52						
Calcium				9.2						10.9			11.4						
Carbonate																			
NH3-N	mg/L						0.059												
Total Nitrogen							0.066												
Cl	mg/L			349			339			337			340						348
EC	uS/cm			1280			1240			1280			1250						1320
O2	mg/L						5.6												
Phosphate as PO4-P	mg/L																		
Total Phosphorus							1												
pH Lab				6.3			6.3			6.4			6.3						6.3
Potassium				10.4						11.2			11						
Sodium				155						169			159						166
Sulphate	mg/L			40			39			40			41						39
TDS	mg/L			660			640			640			680						690
N	mg/L																		
Phos	mg/L																		

20083645		Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
Date		6/07/2021	11/08/2021	16/09/2021	15/10/2021	11/11/2021	15/12/2021	13/01/2022	9/02/2022	2/03/2022	4/04/2022	18/05/2022	14/06/2022	19/07/2022	10/08/2022	14/09/2022	20/10/2022	22/11/2022	14/12/2022
Casing Height above topo	m	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Depth of bore	m	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00
SWL (m)	m (from top of casing)	0	0	0	0	0.2	0.67	1.22	1.02	3.66	1.7	1.85	1.82	0.9	0	0.99	0.84	0.92	2.3
m AHD		20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6
Purge	L																		
pH				6.47			6.64			6.49			6.41			6.26			6.16
Temp	degrees C			16.7			18			18.9			17.1			16.4			19
Cond (EC)	uS/cm			1400			1450			1530			1400			2040			2220
Salinity	ppm			700			730			760			700			1030			1110
ROP mv (Field)				355			272			301			311			323			260
Alkalinity (Field)				96			78			66			87			105			90
TTA				135			135			145			200			200			180
Do %S																			
Comments		Dip Only	Dip Only		Dip Only	Dip Only		Dip Only	Dip Only		Dip Only	Dip Only		Dip Only	Dip Only		Dip Only	Dip Only	
Al (filtered)	mg/L			0.031			0.038			0.036			0.026			0.036			0.04
Al(Total)	mg/L																		
As	mg/L																		
B	mg/L																		
Cd	mg/L																		
Ca	mg/L																		
Cr	mg/L																		
Co	mg/L																		
Cu	mg/L																		
Fe (Filtered)	mg/L			38			38			36			34			50			40
Fe (Total)	mg/L																		
Pb	mg/L																		
Mn	mg/L			0.61			0.61			0.58			0.58			0.81			0.7
Mg	mg/L						29.2			27.7			26.7			48.5			39.3
Mercury	mg/L																		
Molybdenum	mg/L																		
Ni	mg/L																		
Se	mg/L																		
U	mg/L																		
Zn	mg/L																		
Fl as F																			
CaCO3 (Acidity)	mg/L			100			97			96			110			110			57
CaCO3 (Alkalinity)	mg/L			43			65			59			63			41			33
Bicarbonate							65			59			63			41			33
Calcium							12.1			10.7			10.7			18.5			14.1
Carbonate																			
NH3-N	mg/L																		
Total Nitrogen																			
Cl	mg/L			369			346			334			348			657			556
EC	uS/cm			1290			1280			1310			1320			2260			1960
O2	mg/L																		
Phosphate as PO4-P	mg/L																		
Total Phosphorus																			
pH Lab				6.6			6.6			6.5			6.4			6.1			6.6
Potassium							22.7			11.6			11.2			13.6			12.3
Sodium				176			177			168			162			325			287
Sulphate	mg/L			40			38			38			38			70			58
TDS	mg/L			640			720			630			680			1200			970
N	mg/L																		
Phos	mg/L																		

Windmill and tank on Lot 103. 90m north of Princefield SW of house.fitted out or refirb June 2006 sample might need to be taken from tank/pipe. Leederville. Doesn't usually overflow in winter.

Wont get camera down

23040930		Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18
Date						31/05/2017	27/06/2017	25/07/2017	15/08/2017	19/09/2017	17/10/2017	14/11/2017	14/12/2017	15/01/2018	13/02/2018	13/03/2018	16/04/2018	9/05/2018	13/06/2018
Casing Height above topo	m	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45
Depth of bore	m	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
SWL (m)	m (from top of casing)					1.12	1.99	1.44	1.14	1.72	1.7	2.24	2.46	2.78	2.35	2.76	2.76	2.43	1.44
m AHD						19.13	18.26	18.81	19.11	18.53	18.55	18.01	17.79	17.47	17.90	17.49	17.49	17.82	18.81
Purge	L																		
pH																			
Temp	degrees C																		
Cond (EC)	uS/cm																		
Salinity	ppm																		
ROP mv (Field)																			
Alkalinity (Field)																			
TTA																			
Do %S																			
Comments						Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only
Al (filtered)	mg/L																		
Al(Total)	mg/L																		
As	mg/L																		
B	mg/L																		
Cd	mg/L																		
Ca	mg/L																		
Cr	mg/L																		
Co	mg/L																		
Cu	mg/L																		
Fe (Filtered)	mg/L																		
Fe (Total)	mg/L																		
Pb	mg/L																		
Mn	mg/L																		
Mg	mg/L																		
Mercury	mg/L																		
Molybdenum	mg/L																		
Ni	mg/L																		
Se	mg/L																		
U	mg/L																		
Zn	mg/L																		
Fl as F																			
$CaCO_3$ (Acidity)	mg/L																		
$CaCO_3$ (Alkalinity)	mg/L																		
Bicarbonate																			
Calcium																			
Carbonate																			
NH_3-N	mg/L																		
Cl	mg/L																		
EC	uS/cm																		
O_2	mg/L																		
P	mg/L																		
pH Lab																			
Potassium																			
Sodium																			
Sulphate	mg/L																		
TDS	mg/L																		
N	mg/L																		
Phos	mg/L																		

23040930		Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
Date		11/07/2018	13/08/2018	11/09/2018	10/10/2018	12/11/2018	10/12/2018	14/01/2019	11/02/2019	11/03/2019	10/04/2019	8/05/2019	12/06/2019	12/07/2019	9/08/2019	11/09/2019	9/10/2019	12/11/2019	9/12/2019
Casing Height above topo	m	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45
Depth of bore	m	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
SWL (m)	m (from top of casing)	1.2	1.06	1.13	2.17	2.11	2.62	2.91	2.6	2.55	2.59	2.55	2.03	1.31	1.42	1.37	2.14	2.5	2.32
m AHD		19.05	19.19	19.12	18.08	18.14	17.63	17.34	17.65	17.70	17.66	17.70	18.22	18.94	18.83	18.88	18.11	17.75	17.93
Purge	L																		
pH																			
Temp	degrees C																		
Cond (EC)	uS/cm																		
Salinity	ppm																		
ROP mv (Field)																			
Alkalinity (Field)																			
TTA																			
Do %S																			
Comments		Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only
Al (filtered)	mg/L																		
Al(Total)	mg/L																		
As	mg/L																		
B	mg/L																		
Cd	mg/L																		
Ca	mg/L																		
Cr	mg/L																		
Co	mg/L																		
Cu	mg/L																		
Fe (Filtered)	mg/L																		
Fe (Total)	mg/L																		
Pb	mg/L																		
Mn	mg/L																		
Mg	mg/L																		
Mercury	mg/L																		
Molybdenum	mg/L																		
Ni	mg/L																		
Se	mg/L																		
U	mg/L																		
Zn	mg/L																		
Fl as F																			
$CaCO_3$ (Acidity)	mg/L																		
$CaCO_3$ (Alkalinity)	mg/L																		
Bicarbonate																			
Calcium																			
Carbonate																			
NH_3-N	mg/L																		
Cl	mg/L																		
EC	uS/cm																		
O_2	mg/L																		
P	mg/L																		
pH Lab																			
Potassium																			
Sodium																			
Sulphate	mg/L																		
TDS	mg/L																		
N	mg/L																		
Phos	mg/L																		

23040930		Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21
Date		13/01/2020	10/02/2020	11/03/2020	24/04/2020	11/05/2020	10/06/2020	10/07/2020	7/08/2020	8/09/2020	14/10/2020	10/11/2020	9/12/2020	15/01/2021	10/02/2021	16/03/2021	1/04/2021	5/05/2021	10/06/2021
Casing Height above topo	m	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45
Depth of bore	m	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
SWL (m)	m (from top of casing)	2.5	2.56	2.63	2.49	2.17	1.92	1.44	1.28	1.24	1.85	1.94	2.14	2.45	2.35	2.29	2.58	2.02	1.94
m AHD		17.75	17.69	17.62	17.76	18.08	18.33	18.81	18.97	19.01	18.40	18.31	18.11	17.80	17.90	17.96	17.67	18.23	18.31
Purge	L																		
pH																			
Temp	degrees C																		
Cond (EC)	uS/cm																		
Salinity	ppm																		
ROP mv (Field)																			
Alkalinity (Field)																			
TTA																			
Do %S																			
Comments		Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only
Al (filtered)	mg/L																		
Al(Total)	mg/L																		
As	mg/L																		
B	mg/L																		
Cd	mg/L																		
Ca	mg/L																		
Cr	mg/L																		
Co	mg/L																		
Cu	mg/L																		
Fe (Filtered)	mg/L																		
Fe (Total)	mg/L																		
Pb	mg/L																		
Mn	mg/L																		
Mg	mg/L																		
Mercury	mg/L																		
Molybdenum	mg/L																		
Ni	mg/L																		
Se	mg/L																		
U	mg/L																		
Zn	mg/L																		
Fl as F																			
$CaCO_3$ (Acidity)	mg/L																		
$CaCO_3$ (Alkalinity)	mg/L																		
Bicarbonate																			
Calcium																			
Carbonate																			
NH_3-N	mg/L																		
Cl	mg/L																		
EC	uS/cm																		
O_2	mg/L																		
P	mg/L																		
pH Lab																			
Potassium																			
Sodium																			
Sulphate	mg/L																		
TDS	mg/L																		
N	mg/L																		
Phos	mg/L																		

23040930		Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
Date		6/07/2021	11/08/2021	16/09/2021	15/10/2021	11/11/2021	15/12/2021	11/01/2022	9/02/2022	2/03/2022	5/04/2022	17/05/2022	14/06/2022	19/07/2022	10/08/2022	14/09/2022	20/10/2022	22/11/2022	13/12/2022
Casing Height above topo	m	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45
Depth of bore	m	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
SWL (m)	m (from top of casing)	1.32	1.1	1.2	1.62	1.85	2.17	2.33	2.49	2.77	2.75	2.8	2.53	2.2	1.6	2	1.6	1.72	1.8
m AHD		18.93	19.15	19.05	18.63	18.40	18.08	17.92	17.76	17.48	17.50	17.45	17.72	18.05	18.65	18.25	18.65	18.53	18.45
Purge	L																		
pH																			
Temp	degrees C																		
Cond (EC)	uS/cm																		
Salinity	ppm																		
ROP mv (Field)																			
Alkalinity (Field)																			
TTA																			
Do %S																			
Comments		Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only
Al (filtered)	mg/L																		
Al(Total)	mg/L																		
As	mg/L																		
B	mg/L																		
Cd	mg/L																		
Ca	mg/L																		
Cr	mg/L																		
Co	mg/L																		
Cu	mg/L																		
Fe (Filtered)	mg/L																		
Fe (Total)	mg/L																		
Pb	mg/L																		
Mn	mg/L																		
Mg	mg/L																		
Mercury	mg/L																		
Molybdenum	mg/L																		
Ni	mg/L																		
Se	mg/L																		
U	mg/L																		
Zn	mg/L																		
Fl as F																			
$CaCO_3$ (Acidity)	mg/L																		
$CaCO_3$ (Alkalinity)	mg/L																		
Bicarbonate																			
Calcium																			
Carbonate																			
NH_3-N	mg/L																		
Cl	mg/L																		
EC	uS/cm																		
O_2	mg/L																		
P	mg/L																		
pH Lab																			
Potassium																			
Sodium																			
Sulphate	mg/L																		
TDS	mg/L																		
N	mg/L																		
Phos	mg/L																		

LOT200_BORE. JANE GILLHAM (PREV GRONYA SWIFT > PREV CHRIS BRAND) HOUSE. Unwilling to dip due to cables and pipes catching the dipper.

House Bore - No access for camera or dipping.

LOT200_BORE		Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17
Date							27/06/2017	25/07/2017	15/08/2017	19/09/2017	17/10/2017	14/11/2017	14/12/2017
Casing Height above topo	m	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Depth of bore	m	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00
SWL (m)	m (from top of casing)												
m AHD													
Purge	L												
pH							5.94	6.12	5.97	6.12	6.3	6.54	6.24
Temp	degrees C						18.6	17	17.7	18.6	18	18.5	20.4
Cond (EC)	uS/cm						790	760	780	820	820	750	820
Salinity	ppm						400	380	390	410	410	380	410
ROP mv (Field)							-36	-26	-10	-52	5	84	132
Alkalinity (Field)										117	96	66	96
TTA										180	135	120	180
Do %S								14	14.9	22.9	30.6	25.1	31.9
Comments						too many cables TO DIP							
Al (filtered)	mg/L						0.065	0.08	0.07	0.012	0.059	0.055	0.055
Al(Total)	mg/L						0.072			0.12			0.069
As	mg/L						0.0007			<0.0001			0.0004
B	mg/L												
Cd	mg/L						<0.0001			<0.0001			<0.0001
Ca	mg/L												
Cr	mg/L						<0.0001			<0.0001			<0.0001
Co	mg/L												
Cu	mg/L												
Fe (Filtered)	mg/L						36	39	39	45	38	33	25
Fe (Total)	mg/L						38			49			33
Pb	mg/L												
Mn	mg/L						0.50	0.51	0.51	0.63	0.52	0.49	0.41
Mg	mg/L							14	14.1		14.6	14.3	
Mercury	mg/L												
Molybdenum	mg/L												
Ni	mg/L						0.013			<0.0005			0.0083
Se	mg/L						<0.0002			<0.0002			<0.0002
U	mg/L												
Zn	mg/L						0.022			0.022			0.011
Fl as F													
CaCO3 (Acidity)	mg/L						150	150	150	79	54	58	66
CaCO3 (Alkalinity)	mg/L						61	78	82	55	46	47	24
Bicarbonate								78	82		46	47	
Calcium								9.2	8.6		9.4	9.3	
Carbonate								<1	<1		<1	<1	
NH3-N	mg/L						0.017			0.049			0.047
Total Nitrogen							0.14			0.12			0.031
Cl	mg/L						160	160	170	170	170	160	170
EC	uS/cm						674	697	704	639	654	658	621
O2	mg/L						3.2			6.4			7.2
Phosphate as PO4-P	mg/L						0.008			<0.005			0.013
Total Phosphorus							0.76			0.61			1.5
pH Lab							6.2	6.3	6.3	6.2	6.3	6.3	5.8
Potassium								10.4	9.8		9.9	10.5	
Sodium								77	66.6		70.3	78	
Sulphate	mg/L						7	14	13	7	13	12	14
TDS	mg/L						370	360	360	330	350	390	320
N	mg/L												
Phos	mg/L												

LOT200_BORE		Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
Date		15/01/2018	13/02/2018	13/03/2018	16/04/2018	9/05/2018	13/06/2018			11/09/2018			10/12/2018
Casing Height above topo	m	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Depth of bore	m	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00
SWL (m)	m (from top of casing)							No Dip	No Dip		No Dip	No Dip	
m AHD													
Purge	L												
pH		6.18	6.3	6.23	6.15	6.26	6.21			6.16			5.91
Temp	degrees C	20.4	18.3	19.8	17.2	15.7	14.3			15.4			17.1
Cond (EC)	uS/cm	850	770	760	770	770	800			830			750
Salinity	ppm	430	390	380	380	380	400			410			380
ROP mv (Field)		169	196	204	229	248	316			35			210
Alkalinity (Field)		90	96	111	96	75	87			117			69
TTA		135	145	180	170	160	160			140			165
Do %S		28.4	34.4	27.8		29.7	29.1			31.3			32.4
Comments													
Al (filtered)	mg/L	0.059	0.035	0.045	0.036	0.039	0.030			0.031			0.065
Al(Total)	mg/L			0.055			0.033						
As	mg/L			0.0004			0.0002						
B	mg/L												
Cd	mg/L			<0.0001			<0.0001						
Ca	mg/L												
Cr	mg/L			<0.0001			<0.0001						
Co	mg/L												
Cu	mg/L												
Fe (Filtered)	mg/L	32	29	30	30	36	26			32			31
Fe (Total)	mg/L			38			30						
Pb	mg/L												
Mn	mg/L	0.50	0.45	0.47	0.49	0.52	0.42			0.53			0.50
Mg	mg/L	14	15.1		13.8	14.4				13.3			14.3
Mercury	mg/L												
Molybdenum	mg/L												
Ni	mg/L			0.014			0.013						
Se	mg/L			<0.0002			<0.0002						
U	mg/L												
Zn	mg/L			0.016			0.004						
Fl as F													
CaCO3 (Acidity)	mg/L	110	100	100	80	87	110			93			110
CaCO3 (Alkalinity)	mg/L	56	70	63	64	75	83			85			20
Bicarbonate		56	70		64	75				84			20
Calcium		8.3	8.4		7.9	8.4				8.5			8.4
Carbonate													
NH3-N	mg/L			0.059			0.022						
Total Nitrogen				0.034			<0.025						
Cl	mg/L	160	170	150	170	170	170			160			163
EC	uS/cm	673	671	668	683	732	718			686			627
O2	mg/L			7			7.1						
Phosphate as PO4-P	mg/L			0.016			0.005						
Total Phosphorus				1.7			0.97						
pH Lab		6.1	6.3	6.2	6.3	6.5	6.5			6.4			5.5
Potassium		8.8	10.4		9.7	10				8.7			9.1
Sodium		74.9	83.1		73.8	79.3				79.9			72.4
Sulphate	mg/L	21	18	15	15	14	13			<5			16
TDS	mg/L	344	396	343	308	372	390			360			390
N	mg/L												
Phos	mg/L												

LOT200_BORE		Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
Date				11/03/2019			12/06/2019			11/09/2019			9/12/2019
Casing Height above topo	m	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Depth of bore	m	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00
SWL (m)	m (from top of casing)	No Dip	No Dip				No Dip			No Dip			No Dip
m AHD													
Purge	L												
pH				6.24			6.27			6.27			6.42
Temp	degrees C			18.9			12.6			17.1			18
Cond (EC)	uS/cm			820			770			850			850
Salinity	ppm			410			380			420			420
ROP mv (Field)				102			224			254			233
Alkalinity (Field)				99			75			81			84
TTA				175			140			130			135
Do %S				30.5			22.1			33.8			36.1
Comments													
Al (filtered)	mg/L			0.041			0.037			0.025			0.033
Al(Total)	mg/L						0.076						
As	mg/L						0.0002						
B	mg/L												
Cd	mg/L						<0.0001						
Ca	mg/L												
Cr	mg/L						<0.0001						
Co	mg/L												
Cu	mg/L												
Fe (Filtered)	mg/L			37			32			20			34
Fe (Total)	mg/L						40						
Pb	mg/L												
Mn	mg/L			0.51			0.46			0.34			0.48
Mg	mg/L			15						14.2			13.6
Mercury	mg/L												
Molybdenum	mg/L												
Ni	mg/L						0.015						
Se	mg/L						<0.0002						
U	mg/L												
Zn	mg/L						0.029						
Fl as F													
CaCO3 (Acidity)	mg/L			56			100			39			93
CaCO3 (Alkalinity)	mg/L			27			29			53			60
Bicarbonate				27						53			60
Calcium				8.9						17.6			8
Carbonate													
NH3-N	mg/L						0.021						
Total Nitrogen							0.073						
Cl	mg/L			171			165			151			171
EC	uS/cm			614			689			670			683
O2	mg/L						6.7						
Phosphate as PO4-P	mg/L												
Total Phosphorus							0.77						
pH Lab				6.2			6.3			6.4			6.4
Potassium				10.5						10.1			9.6
Sodium				79.7						75.8			73.1
Sulphate	mg/L			17			14			14			16
TDS	mg/L			330			400			350			370
N	mg/L												
Phos	mg/L												

LOT200_BORE		Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Date				11/03/2020			10/06/2020			17/09/2020			9/12/2020
Casing Height above topo	m	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Depth of bore	m	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00
SWL (m)	m (from top of casing)			No Dip			No Dip			No Dip			No Dip
m AHD													
Purge	L												
pH				6.25			6.32			6.46			6.35
Temp	degrees C			19.6			15.8			12.7			18.6
Cond (EC)	uS/cm			740			730			740			730
Salinity	ppm			370			360			370			370
ROP mv (Field)				311			285			359			364
Alkalinity (Field)				120			87			90			81
TTA				150			155			125			135
Do %S				22.2			26.5			30.4			36.8
Comments													
Al (filtered)	mg/L			0.038			0.034			0.06			0.023
Al(Total)	mg/L						0.048						
As	mg/L						<0.0001						
B	mg/L												
Cd	mg/L						<0.0001						
Ca	mg/L												
Cr	mg/L						<0.0001						
Co	mg/L												
Cu	mg/L												
Fe (Filtered)	mg/L			36			37			36			34
Fe (Total)	mg/L						38						
Pb	mg/L												
Mn	mg/L			0.50			0.48			0.52			0.50
Mg	mg/L			13.7						13.9			13.9
Mercury	mg/L												
Molybdenum	mg/L												
Ni	mg/L						0.0019						
Se	mg/L						<0.0002						
U	mg/L												
Zn	mg/L						0.006						
Fl as F													
CaCO3 (Acidity)	mg/L			90			95			78			69
CaCO3 (Alkalinity)	mg/L			62			76			43			41
Bicarbonate				62						43			41
Calcium				7.8						8.4			9.7
Carbonate													
NH3-N	mg/L						0.027						
Total Nitrogen							0.06						
Cl	mg/L			171			166			169			171
EC	uS/cm			684			686			642			672
O2	mg/L						6.6						
Phosphate as PO4-P	mg/L												
Total Phosphorus							0.85						
pH Lab				6.4			6.5			6.1			6.5
Potassium				9.8						9.9			9.7
Sodium				74.2						72.7			72.7
Sulphate	mg/L			16			13			14			14
TDS	mg/L			320			350			360			360
N	mg/L												
Phos	mg/L												

LOT200_BORE		Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
Date				15/03/2021			14/06/2021			7/09/2021			7/12/2021
Casing Height above topo	m	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Depth of bore	m	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00
SWL (m)	m (from top of casing)			No Dip			No Dip			No dip			No dip
m AHD													
Purge	L												
pH				6.25			6.6			6.63			6.83
Temp	degrees C			18.2			16			18.7			23.3
Cond (EC)	uS/cm			750			780			760			870
Salinity	ppm			380			390			380			430
ROP mv (Field)				379			390			303			404
Alkalinity (Field)				75			105			78			135
TTA				141			130			140			130
Do %S				27.4									
Comments													
Al (filtered)	mg/L			0.027			0.023			0.023			0.019
Al(Total)	mg/L												
As	mg/L												
B	mg/L												
Cd	mg/L												
Ca	mg/L												
Cr	mg/L												
Co	mg/L												
Cu	mg/L												
Fe (Filtered)	mg/L			31			36			38			13
Fe (Total)	mg/L												
Pb	mg/L												
Mn	mg/L			0.51			0.52			0.51			0.28
Mg	mg/L			15.2									16.3
Mercury	mg/L												
Molybdenum	mg/L												
Ni	mg/L												
Se	mg/L												
U	mg/L												
Zn	mg/L												
Fl as F													
CaCO3 (Acidity)	mg/L			81			91			73			92
CaCO3 (Alkalinity)	mg/L			51			66			41			44
Bicarbonate				51									44
Calcium				9									35.7
Carbonate													
NH3-N	mg/L												
Total Nitrogen													
Cl	mg/L			166			168			168			169
EC	uS/cm			673			686			654			644
O2	mg/L												
Phosphate as PO4-P	mg/L												
Total Phosphorus													
pH Lab				6.6			6.4			6.2			6.3
Potassium				11.1									11.9
Sodium				81.9			75.2			77.5			82.8
Sulphate	mg/L			15			14			14			15
TDS	mg/L			360			350			360			310
N	mg/L												
Phos	mg/L												

LOT200_BORE		Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
Date				3/03/202			23/06/202			28/09/202			15/12/202
Casing Height above topo	m	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Depth of bore	m	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00
SWL (m)	m (from top of casing)			No dip			No dip			No dip			No dip
m AHD													
Purge	L												
pH				6.34			6.43			6.46			7.35
Temp	degrees C			19.3			17.6			19.2			18.9
Cond (EC)	uS/cm			880			790			760			890
Salinity	ppm			440			390			386			450
ROP mv (Field)				301			335			328			280
Alkalinity (Field)				108			66			75			135
TTA				135			140			120			100
Do %S													
Comments													
Al (filtered)	mg/L			0.028			<0.005			0.037			0.019
Al(Total)	mg/L												
As	mg/L												
B	mg/L												
Cd	mg/L												
Ca	mg/L												
Cr	mg/L												
Co	mg/L												
Cu	mg/L												
Fe (Filtered)	mg/L			32			2.8			35			0.35
Fe (Total)	mg/L												
Pb	mg/L												
Mn	mg/L			0.5			0.49			0.54			0.5
Mg	mg/L			14.5			14			16.2			15.1
Mercury	mg/L												
Molybdenum	mg/L												
Ni	mg/L												
Se	mg/L												
U	mg/L												
Zn	mg/L												
Fl as F													
CaCO3 (Acidity)	mg/L			75			110			86			86
CaCO3 (Alkalinity)	mg/L			45			54			55			61
Bicarbonate				45			54			55			61
Calcium				9.2			8.2			9.4			9.6
Carbonate													
NH3-N	mg/L												
Total Nitrogen													
Cl	mg/L			165			168			169			170
EC	uS/cm			645			662			661			660
O2	mg/L												
Phosphate as PO4-P	mg/L												
Total Phosphorus													
pH Lab				6.4			6.2			6.2			6.2
Potassium				10.2			9.7			11.3			10.8
Sodium				76.3			75.2			85.2			85.6
Sulphate	mg/L			15			15			15			15
TDS	mg/L			320			330			300			360
N	mg/L												
Phos	mg/L												

LOT 229 PHILIPS. SOUTHERN DEFUNCT WINDMILL 500M SOUTH OF PRINCEFIELD RD.

Possible Bore but no access for camera

LOT229_WM2		Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
Date							1/06/2017	27/06/2017	25/07/2017		17/10/2017	14/11/2017	13/12/2017	11/01/2018	12/02/2018	12/03/2018	12/04/2018	8/05/2018	12/06/2018	10/07/2018	9/08/2018	10/09/2018	11/10/2018	8/11/2018	11/12/2018
Casing Height above topo	m	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Depth of bore	m	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00
SWL (m)	m (from top of casing)						0.8	0.59			0.06	0.48	0.76	0.91	0.94	1.13	1.2	1.16	0.05	0			0.12	0.45	0.8
m AHD							18.37	18.58			19.11	18.69	18.41	18.26	18.23	18.04	17.97	18.01	19.12	19.17			19.05	18.72	18.37
Purge	L																								
pH																									
Temp	degrees C																								
Cond (EC)	uS/cm																								
Salinity	ppm																								
ROP mv (Field)																									
Alkalinity (Field)																									
TTA																									
Do %S																									
Comments							Dip Only	Dip Only	No Access	No Access	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	No Access	No Access	Dip Only	Dip Only	Dip Only
Al (filtered)	mg/L																								
Al(Total)	mg/L																								
As	mg/L																								
B	mg/L																								
Cd	mg/L																								
Ca	mg/L																								
Cr	mg/L																								
Co	mg/L																								
Cu	mg/L																								
Fe (Filtered)	mg/L																								
Fe (Total)	mg/L																								
Pb	mg/L																								
Mn	mg/L																								
Mg	mg/L																								
Mercury	mg/L																								
Molybdenum	mg/L																								
Ni	mg/L																								
Se	mg/L																								
U	mg/L																								
Zn	mg/L																								
Fl as F																									
CaCO3 (Acidity)	mg/L																								
CaCO3 (Alkalinity)	mg/L																								
Bicarbonate																									
Calcium																									
Carbonate																									
NH3-N	mg/L																								
Cl	mg/L																								
EC	uS/cm																								
O2	mg/L																								
P	mg/L																								
pH Lab																									
Potassium																									
Sodium																									
Sulphate	mg/L																								
TDS	mg/L																								
N	mg/L																								
Phos	mg/L																								

LOT229_WM2		Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Date		14/01/2019	11/02/2019	13/03/2019	10/04/2019	9/05/2019	13/06/2019	11/07/2019	14/08/2019	12/09/2019	10/10/2019	12/11/2019	12/12/2019	14/01/2020	13/02/2020	13/03/2020	9/04/2020	11/05/2020	9/06/2020	13/07/2020	6/08/2020	9/09/2020	14/10/2020	10/11/2020	8/12/2020
Casing Height above topo	m	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Depth of bore	m	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00
SWL (m)	m (from top of casing)	1.03		1.25	1.34	1.31	0.65	0	0.05	0	0.2	0.6	0.85	1.12	1.25	1.46	1.78	1.05	0.68	0.05	0	0	0.13	0.47	0.71
m AHD		18.14		17.92	17.83	17.86	18.52	19.17	19.12	19.17	18.97	18.57	18.32	18.05	17.92	17.71	17.39	18.12	18.49	19.12	19.17	19.17	19.04	18.70	18.46
Purge	L																								
pH																									
Temp	degrees C																								
Cond (EC)	uS/cm																								
Salinity	ppm																								
ROP mv (Field)																									
Alkalinity (Field)																									
TTA																									
Do %S																									
Comments		Dip Only	No Access	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only
Al (filtered)	mg/L																								
Al(Total)	mg/L																								
As	mg/L																								
B	mg/L																								
Cd	mg/L																								
Ca	mg/L																								
Cr	mg/L																								
Co	mg/L																								
Cu	mg/L																								
Fe (Filtered)	mg/L																								
Fe (Total)	mg/L																								
Pb	mg/L																								
Mn	mg/L																								
Mg	mg/L																								
Mercury	mg/L																								
Molybdenum	mg/L																								
Ni	mg/L																								
Se	mg/L																								
U	mg/L																								
Zn	mg/L																								
Fl as F																									
CaCO3 (Acidity)	mg/L																								
CaCO3 (Alkalinity)	mg/L																								
Bicarbonate																									
Calcium																									
Carbonate																									
NH3-N	mg/L																								
Cl	mg/L																								
EC	uS/cm																								
O2	mg/L																								
P	mg/L																								
pH Lab																									
Potassium																									
Sodium																									
Sulphate	mg/L																								
TDS	mg/L																								
N	mg/L																								
Phos	mg/L																								

LOT229_WM2		Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
Date		12/01/2021	10/02/2021	11/03/2021	01//04/2021	12/05/2021	9/06/2021	7/07/2021	9/08/2021	13/09/2021	19/10/2021	11/11/2021	15/12/2021												
Casing Height above topo	m	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Depth of bore	m	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00	16.00
SWL (m)	m (from top of casing)	1.14	1.14	1.1	1.29	0.81	0.36	0			0	0.3	0												
m AHD		18.03	18.03	18.07	17.88	18.36	18.81	19.17			19.17	18.87	19.17												
Purge	L																								
pH																									
Temp	degrees C																								
Cond (EC)	uS/cm																								
Salinity	ppm																								
ROP mv (Field)																									
Alkalinity (Field)																									
TTA																									
Do %S																									
Comments		Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	No access	No access	Dip Only	Dip Only	Dip Only												
Al (filtered)	mg/L																								
Al(Total)	mg/L																								
As	mg/L																								
B	mg/L																								
Cd	mg/L																								
Ca	mg/L																								
Cr	mg/L																								
Co	mg/L																								
Cu	mg/L																								
Fe (Filtered)	mg/L																								
Fe (Total)	mg/L																								
Pb	mg/L																								
Mn	mg/L																								
Mg	mg/L																								
Mercury	mg/L																								
Molybdenum	mg/L																								
Ni	mg/L																								
Se	mg/L																								
U	mg/L																								
Zn	mg/L																								
Fl as F																									
CaCO3 (Acidity)	mg/L																								
CaCO3 (Alkalinity)	mg/L																								
Bicarbonate																									
Calcium																									
Carbonate																									
NH3-N	mg/L																								
Cl	mg/L																								
EC	uS/cm																								
O2	mg/L																								
P	mg/L																								
pH Lab																									
Potassium																									
Sodium																									
Sulphate	mg/L																								
TDS	mg/L																								
N	mg/L																								
Phos	mg/L																								

LOT421_BORE. PREV RUN TO SERVICE DAIRY ON LOT 843.NEAR SMALL DAM JUST SOUTH OF ROAD. OWNED BY JEREMY STEPHANI

Bore which feeds dam - not accessible for dipper or camera

LOT421_BORE1		Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17
Date							29/06/2017	25/07/2017	15/08/2017	20/09/2017	17/10/2017	14/11/2017	14/12/2017
Casing Height above topo	m	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Depth of bore	m	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00
SWL (m)	m (from top of casing)												
m AHD													
Purge	L												
pH							6.04		6.01	5.77	5.99	6.02	5.92
Temp	degrees C						16.6		16.6	18.6	17.8	18.6	20.4
Cond (EC)	uS/cm						1330		1390	1410	1490	1370	1420
Salinity	ppm						670		700	710	740	680	710
ROP mv (Field)							-38		81	90	43	85	146
Alkalinity (Field)										102	105	87	78
TTA										245	213	220	200
Do %S									18.4	12.6	15.8	10.9	12.2
Comments							No Dip	No Dip	240V repaired				
Al (filtered)	mg/L						0.050		0.039	0.016	0.067	0.034	0.085
Al(Total)	mg/L						0.076			0.060			0.15
As	mg/L						0.0006			0.0006			0.0005
B	mg/L												
Cd	mg/L						<0.0001			<0.0001			<0.0001
Ca	mg/L												
Cr	mg/L						<0.0001			<0.0001			0.0002
Co	mg/L												
Cu	mg/L												
Fe (Filtered)	mg/L						22		22	21	22	19	23
Fe (Total)	mg/L						29			28			25
Pb	mg/L												
Mn	mg/L						0.61		0.61	0.63	0.66	0.59	0.66
Mg	mg/L								25.1		27.1	25.2	
Mercury	mg/L												
Molybdenum	mg/L												
Ni	mg/L						0.0048			0.0059			0.005
Se	mg/L						<0.0002			<0.0002			<0.0002
U	mg/L												
Zn	mg/L						0.007			0.014			0.007
Fl as F													
CaCO3 (Acidity)	mg/L						130		110	110	56	72	100
CaCO3 (Alkalinity)	mg/L						74		77	90	54	52	52
Bicarbonate									77		54	52	
Calcium									4.9		5.5	5.1	
Carbonate									<1		<1	<1	
NH3-N	mg/L						0.038			0.047			0.038
Total Nitrogen							0.081			0.085			<0.025
Cl	mg/L						330		340	330	330	320	330
EC	uS/cm						1280		1290	1300	1220	1230	1230
O2	mg/L						2.6			3.4			2
Phosphate as PO4-P	mg/L						0.008			<0.005			0.010
Total Phosphorus							57			2			0.85
pH Lab							6.2		6.3	6.3	6.1	6	6
Potassium									7.7		7.6	7.4	
Sodium									140		147	191	
Sulphate	mg/L						38		34	35	33	30	37
TDS	mg/L						700		600	690	660	640	670
N	mg/L												
Phos	mg/L												

LOT421_BORE1		Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
Date		15/01/2018	13/02/2018	13/03/2018	16/04/2018	9/05/2018	13/06/2018	11/07/2018	13/08/2018	11/09/2018			10/12/2018
Casing Height above topo	m	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Depth of bore	m	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00
SWL (m)	m (from top of casing)												
m AHD													
Purge	L												
pH		5.94	5.95	5.97	5.8	5.85	5.82			5.89			5.8
Temp	degrees C	20	18.3	19.1	17.4	16.4	15.8			15.9			18.1
Cond (EC)	uS/cm	1480	1370	1350	1360	1380	1380			1420			1370
Salinity	ppm	740	680	680	680	670	690			710			680
ROP mv (Field)		144	180	216	236	246	314			50			184
Alkalinity (Field)		72	99	138	90	60	66			87			75
TTA		195	190	210	220	230	160			160			180
Do %S		10	13.4	9.9		18.4	17.1			16			17.9
Comments								No Dip	No Dip		No Dip	No Dip	
Al (filtered)	mg/L	0.036	0.027	0.023	0.018	0.026	0.20			0.020			0.021
Al(Total)	mg/L			0.10			0.023						
As	mg/L			0.0005			0.0006						
B	mg/L												
Cd	mg/L			<0.0001			<0.0001						
Ca	mg/L												
Cr	mg/L			<0.0001			<0.0001						
Co	mg/L												
Cu	mg/L												
Fe (Filtered)	mg/L	21	22	20	17	21	16			20			16
Fe (Total)	mg/L			29			17						
Pb	mg/L												
Mn	mg/L	0.61	0.57	0.58	0.53	0.60	0.49			0.58			0.52
Mg	mg/L	25.9	28.2		25.3	28.9				25.3			23.5
Mercury	mg/L												
Molybdenum	mg/L												
Ni	mg/L			0.0051			0.0055						
Se	mg/L			<0.0002			<0.0002						
U	mg/L												
Zn	mg/L			0.008			0.009						
Fl as F													
CaCO3 (Acidity)	mg/L	120	99	130	70	100	100			100			110
CaCO3 (Alkalinity)	mg/L	55	57	60	51	71	75			61			51
Bicarbonate		55	57		51	71				61			51
Calcium		5.5	5.4		5.1	5.7				5.2			4.7
Carbonate													
NH3-N	mg/L			0.064			0.049						
Total Nitrogen				0.078			0.15						
Cl	mg/L	330	350	310	340	350	350			330			327
EC	uS/cm	1240	1230	1230	1270	1330	1280			1280			1240
O2	mg/L			2.2			3.2						
Phosphate as PO4-P	mg/L			0.01			<0.005						
Total Phosphorus				0.96			0.80						
pH Lab		5.9	6	5.9	6.1	6.2	6.4			6.1			5.9
Potassium		7.5	8.4		8	7.8				7.4			6.9
Sodium		193	216		188	200				188			175
Sulphate	mg/L	43	40	34	34	35	33			34			35
TDS	mg/L	688	684	622	586	689	692			639			660
N	mg/L												
Phos	mg/L												

LOT421_BORE1		Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
Date				11/03/2019			12/06/2019			11/09/2019			9/12/2019
Casing Height above topo	m	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Depth of bore	m	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00
SWL (m)	m (from top of casing)												
m AHD													
Purge	L												
pH				6.02			6			6			6
Temp	degrees C			18.1			15.7			18.3			18.6
Cond (EC)	uS/cm			1470			1070			1470			1500
Salinity	ppm			730			680			740			750
ROP mv (Field)				86			225			252			251
Alkalinity (Field)				102			90			78			66
TTA				210			200			200			210
Do %S				18.7			11.6			19.4			22.7
Comments		No Dip	No Dip		No Dip	No Dip		No Dip	No Dip		No Dip	No Dip	
Al (filtered)	mg/L			0.029			0.039			0.03			0.029
Al(Total)	mg/L						0.094						
As	mg/L						0.0009						
B	mg/L												
Cd	mg/L						<0.0001						
Ca	mg/L												
Cr	mg/L						<0.0001						
Co	mg/L												
Cu	mg/L												
Fe (Filtered)	mg/L			26			26			26			25
Fe (Total)	mg/L						34						
Pb	mg/L												
Mn	mg/L			0.63			0.55			0.57			0.55
Mg	mg/L			28.5						26.1			24.5
Mercury	mg/L												
Molybdenum	mg/L												
Ni	mg/L						0.0064						
Se	mg/L						<0.0002						
U	mg/L												
Zn	mg/L						0.011						
Fl as F													
CaCO3 (Acidity)	mg/L			79			130			64			150
CaCO3 (Alkalinity)	mg/L			46			84			51			65
Bicarbonate				46						51			65
Calcium				5.7						5.4			5
Carbonate													
NH3-N	mg/L						0.017						
Total Nitrogen							0.044						
Cl	mg/L			340			336			324			339
EC	uS/cm			1240			1320			1290			1270
O2	mg/L						3.1						
Phosphate as PO4-P	mg/L												
Total Phosphorus							1.5						
pH Lab				6.1			6.3			6.2			6.2
Potassium				8.3						7.9			7.7
Sodium				204						195			184
Sulphate	mg/L			38			36			33			35
TDS	mg/L			670			720			630			640
N	mg/L												
Phos	mg/L												

LOT421_BORE1		Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Date				11/03/2020			8/06/2020			8/09/2020			7/12/2020
Casing Height above topo	m	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Depth of bore	m	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00
SWL (m)	m (from top of casing)												
m AHD													
Purge	L												
pH				5.91			5.84			5.92			5.99
Temp	degrees C			19.2			17.1			15.9			17.1
Cond (EC)	uS/cm			1320			1290			1300			1350
Salinity	ppm			660			640			650			670
ROP mv (Field)				325			445			373			438
Alkalinity (Field)				96			84			105			111
TTA				210			190			185			215
Do %S				8.6			11.4			10.8			9.8
Comments		No Dip	No Dip		No Dip	No Dip		No Dip	No Dip		No Dip	No Dip	
Al (filtered)	mg/L			0.029			0.022			0.021			0.016
Al(Total)	mg/L						0.055						
As	mg/L						0.0010						
B	mg/L												
Cd	mg/L						<0.0001						
Ca	mg/L												
Cr	mg/L						<0.0001						
Co	mg/L												
Cu	mg/L												
Fe (Filtered)	mg/L			27			26			20			25
Fe (Total)	mg/L						36						
Pb	mg/L												
Mn	mg/L			0.58			0.55			0.56			0.56
Mg	mg/L			24.5						22.8			25.5
Mercury	mg/L												
Molybdenum	mg/L												
Ni	mg/L						0.0061						
Se	mg/L						<0.0002						
U	mg/L												
Zn	mg/L						0.010						
Fl as F													
CaCO3 (Acidity)	mg/L			140			130			150			100
CaCO3 (Alkalinity)	mg/L			93			86			85			51
Bicarbonate				93						85			51
Calcium				5						4.8			5.9
Carbonate													
NH3-N	mg/L						0.035						
Total Nitrogen							0.086						
Cl	mg/L			352			340			340			337
EC	uS/cm			1320			1290			1270			1240
O2	mg/L						3.4						
Phosphate as PO4-P	mg/L						<0.005						
Total Phosphorus							1						
pH Lab				6.3			6.3			6.2			6
Potassium				7.7						7.3			7.6
Sodium				184						200			182
Sulphate	mg/L			35			35			34			35
TDS	mg/L			590			680			650			560
N	mg/L												
Phos	mg/L												

LOT421_BORE1		Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
Date				15/03/2021			14/06/2021			7/09/2021			7/12/2021
Casing Height above topo	m	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Depth of bore	m	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00
SWL (m)	m (from top of casing)												
m AHD													
Purge	L												
pH				5.96			6.15			6.41			6.2
Temp	degrees C			18.4			16.2			19.2			19.7
Cond (EC)	uS/cm			1350			1400			1410			1460
Salinity	ppm			680			700			700			730
ROP mv (Field)				389			397			321			424
Alkalinity (Field)				81			102			96			81
TTA				153			210			150			165
Do %S				13.2									
Comments		No Dip	No Dip	No Dip	No Dip	No Dip	See Note						
Al (filtered)	mg/L			0.028			0.014			0.024			0.043
Al(Total)	mg/L												
As	mg/L												
B	mg/L												
Cd	mg/L												
Ca	mg/L												
Cr	mg/L												
Co	mg/L												
Cu	mg/L												
Fe (Filtered)	mg/L			29			26			25			26
Fe (Total)	mg/L												
Pb	mg/L												
Mn	mg/L			0.63			0.57			0.59			0.61
Mg	mg/L			27.1									26
Mercury	mg/L												
Molybdenum	mg/L												
Ni	mg/L												
Se	mg/L												
U	mg/L												
Zn	mg/L												
Fl as F													
CaCO3 (Acidity)	mg/L			84			150			130			120
CaCO3 (Alkalinity)	mg/L			56			94			80			74
Bicarbonate				56									74
Calcium				5.7									5.6
Carbonate													
NH3-N	mg/L												
Total Nitrogen													
Cl	mg/L			346			343			348			339
EC	uS/cm			1290			1330			1360			1270
O2	mg/L												
Phosphate as PO4-P	mg/L												
Total Phosphorus													
pH Lab				5.7			6.1			6.2			6.4
Potassium				9.1									8.9
Sodium				197			181			188			185
Sulphate	mg/L			34			34			34			35
TDS	mg/L			650			670			680			630
N	mg/L												
Phos	mg/L												

LOT421_BORE1		Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
Date				10/03/2022			16/06/2022		31/08/2022	28/09/2022	20/10/2022		1/12/2022
Casing Height above topo	m	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Depth of bore	m	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00	48.00
SWL (m)	m (from top of casing)												
m AHD													
Purge	L												
pH				6.17			6.14		6.19		5.95		6.24
Temp	degrees C			21			18.3		16.3		18.4		18.7
Cond (EC)	uS/cm			1600			1410		1410		1410		1400
Salinity	ppm			790			700		710		700		700
ROP mv (Field)				364			330		346		280		280
Alkalinity (Field)				90			76		66		51		96
TTA				200			200		190		140		190
Do %S													
Comments													
Al (filtered)	mg/L			0.024					0.034		0.025		0.031
Al(Total)	mg/L												
As	mg/L												
B	mg/L												
Cd	mg/L												
Ca	mg/L												
Cr	mg/L												
Co	mg/L												
Cu	mg/L												
Fe (Filtered)	mg/L			24					30		29		28
Fe (Total)	mg/L												
Pb	mg/L												
Mn	mg/L			0.58					0.62		0.65		0.62
Mg	mg/L			26.5					29.4		27.7		25.8
Mercury	mg/L												
Molybdenum	mg/L												
Ni	mg/L												
Se	mg/L												
U	mg/L												
Zn	mg/L												
Fl as F													
CaCO3 (Acidity)	mg/L			130					110		130		70
CaCO3 (Alkalinity)	mg/L			49					56		51		65
Bicarbonate				49					56		51		65
Calcium				6					6.8		6		5.4
Carbonate													
NH3-N	mg/L												
Total Nitrogen													
Cl	mg/L			333					347		341		345
EC	uS/cm			1280					1270		1280		1200
O2	mg/L												
Phosphate as PO4-P	mg/L												
Total Phosphorus													
pH Lab				6.3					6.2		5.9		6.6
Potassium				9.5					9.1		9.1		8.2
Sodium				197					210		206		187
Sulphate	mg/L			35					35		35		34
TDS	mg/L			620					660		670		620
N	mg/L												
Phos	mg/L												

LOT552_BORE. NEW HOUSE 2016. BASHFORD'S BORE. verbal inidcations of depth. Leederville targetted to gain sufficient water volumes. iron filtering and chlorine tank professionally installed.
Alan Bashford House Bore - No Access for dipper or camera.

LOT552_BORE		Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17
Date							27/06/2017	25/07/2017	15/08/2017	19/09/2017	17/10/2017	14/11/2017	18/12/2017
Casing Height above topo	m		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Depth of bore	m	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
SWL (m)	m (from top of casing)						No Dip	No Dip	No Dip	No Dip	No Dip	No Dip	No Dip
m AHD		23.2											
Purge	L												
pH							5.35	5.42	6.29	4.91	5.96	6.45	6.1
Temp	degrees C						17.4	9.4	17.5	19.3	17.1	22.4	19.8
Cond (EC)	uS/cm						680	680	800	700	850	770	820
Salinity	ppm						340	340	400	350	420	390	410
ROP mv (Field)							192	170	19	319	54	130	227
Alkalinity (Field)										24	87	81	84
TTA										148	235	155	175
Do %S								32.1	36.8	24.2	19.2	21.9	22
Comments													
Al (filtered)	mg/L						0.015	0.066	0.053	0.009	0.060	0.054	0.055
Al(Total)	mg/L						0.023			0.016			0.063
As	mg/L						<0.0001			<0.0001			0.0002
B	mg/L												
Cd	mg/L						<0.0001			<0.0001			<0.0001
Ca	mg/L												
Cr	mg/L						<0.0001			<0.0001			<0.0001
Co	mg/L												
Cu	mg/L												
Fe (Filtered)	mg/L						0.068	33	29	0.14	38	33	32
Fe (Total)	mg/L						0.095			0.51			35
Pb	mg/L												
Mn	mg/L						0.60	0.66	0.64	0.58	0.64	0.58	0.63
Mg	mg/L							14.2	13.9		14.2	14.4	
Mercury	mg/L												
Molybdenum	mg/L												
Ni	mg/L						0.015			0.016			0.017
Se	mg/L						<0.0002			<0.0002			<0.0002
U	mg/L												
Zn	mg/L						0.046			0.083			0.055
Fl as F													
CaCO3 (Acidity)	mg/L						91	130	98	83	91	85	120
CaCO3 (Alkalinity)	mg/L						21	39	68	20	54	56	61
Bicarbonate								39	68		54	56	
Calcium								8.7	7.7		8.1	8.1	
Carbonate								<1	<1		<1	<1	
NH3-N	mg/L						<0.010			<0.010			<0.010
Total Nitrogen							0.036			0.038			0.070
Cl	mg/L						170	170	170	170	170	170	170
EC	uS/cm						613	646	694	608	676	683	690
O2	mg/L						9.2			7.3			5.7
Phosphate as PO4-P	mg/L						<0.005			0.005			0.016
Total Phosphorus							0.007			0.012			0.043
pH Lab							5.8	6	6.5	5.6	6.1	6.3	6.1
Potassium								9.9	9.4		9.1	9.2	
Sodium								79	67.6		68.6	77.9	
Sulphate	mg/L						12	13	13	14	13	13	16
TDS	mg/L						360	360	330	340	350	350	403
N	mg/L												
Phos	mg/L												

LOT552_BORE	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
Date	15/01/2018	13/02/2018	13/03/2018	16/04/2018	9/05/2018	13/06/2018			11/09/2018			10/12/2018
Casing Height above topo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Depth of bore	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
SWL (m)	No Dip	No Dip	No Dip	No Dip	No Dip	No Dip	No Dip	No Dip		No Dip	No Dip	
m AHD												
Purge												
pH	5.89	5.9	5.96	5.8	5.78	5.65			5.9			5.85
Temp	25.1	22.1	20.2	16.5	14	12.1			12.7			19.9
Cond (EC)	850	780	790	800	780	750			840			800
Salinity	430	390	390	400	390	380			420			400
ROP mv (Field)	209	188	210	238	256	320			95			150
Alkalinity (Field)	87	81	132	75	66	66			102			81
TTA	192	210	182	225	235	220			210			215
Do %S	16.9	20.2	16.1	15.4	22.8	20.4			21.7			22.1
Comments												
Al (filtered)	0.062	0.040	0.045	0.037	0.037	0.032			0.041			0.042
Al(Total)			0.059			0.034						
As			0.0004			0.0001						
B												
Cd			<0.0001			<0.0001						
Ca												
Cr			0.0007			<0.0001						
Co												
Cu												
Fe (Filtered)	35	33	37	36	33	27			37			36
Fe (Total)			45			31						
Pb												
Mn	0.59	0.54	0.59	0.57	0.62	0.54			0.62			0.61
Mg	13.1	14.7		13.8	13.9				13.9			14.4
Mercury												
Molybdenum												
Ni			0.015			0.018						
Se			<0.0002			<0.0002						
U												
Zn			0.030			0.043						
Fl as F												
CaCO3 (Acidity)	150	140	150	110	120	140			150			150
CaCO3 (Alkalinity)	64	70	59	59	61	66			78			69
Bicarbonate	64	70		59	61				78			69
Calcium	7.6	7.7		7.5	8.5				8.2			7.9
Carbonate												
NH3-N			0.05			<0.010						
Total Nitrogen			0.039			0.087						
Cl	170	180	160	180	170	180			170			167
EC	686	671	687	698	694	692			705			708
O2			4.5			4.1						
Phosphate as PO4-P			0.18			<0.005						
Total Phosphorus			0.95			0.070						
pH Lab	6	6.1	6	6.2	6.1	6.3			6.1			6.2
Potassium	8.6	10.2		9.9	9.3				9.1			9.5
Sodium	71.8	81.4		76.4	80.8				77.9			78.3
Sulphate	19	14	14	13	14	13			13			14
TDS	354	392	344	274	409	405			350			420
N												
Phos												

LOT552_BORE	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
Date			11/03/2019			12/06/2019			11/09/2019			9/12/2019
Casing Height above topo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Depth of bore	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
SWL (m)	No Dip	No Dip	No Dip			No Dip			No Dip			No Dip
m AHD												
Purge												
pH			5.86			6			6.17			6.02
Temp			21.1			11.5			17.2			18.9
Cond (EC)			820			770			850			870
Salinity			410			390			430			430
ROP mv (Field)			136			217			260			253
Alkalinity (Field)			78			72			81			84
TTA			200			195			190			210
Do %S			24.7			19			28.7			24.2
Comments												
Al (filtered)			0.035			0.043			0.037			0.044
Al(Total)						0.053						
As						0.0004						
B												
Cd						<0.0001						
Ca												
Cr						<0.0001						
Co												
Cu												
Fe (Filtered)			32			34			33			38
Fe (Total)						40						
Pb												
Mn			0.59			0.56			0.57			0.59
Mg			14.9						13.3			13.8
Mercury												
Molybdenum												
Ni						0.021						
Se						<0.0002						
U												
Zn						0.042						
Fl as F												
CaCO3 (Acidity)			110			140			73			170
CaCO3 (Alkalinity)			47			69			42			62
Bicarbonate			47						42			62
Calcium			8.3						7.8			8
Carbonate												
NH3-N						<0.010						
Total Nitrogen						<0.025						
Cl			177			169			164			178
EC			667			698			669			687
O2						3.7						
Phosphate as PO4-P												
Total Phosphorus						1.3						
pH Lab			6.2			6.1			6.3			6.1
Potassium			10.6						9.6			10
Sodium			79.7						73.9			74.3
Sulphate			16			14			14			16
TDS			390			400			340			370
N												
Phos												

LOT552_BORE	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Date			11/03/2020			10/06/2020			8/09/2020			9/12/2020
Casing Height above topo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Depth of bore	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
SWL (m)			No Dip			No Dip			No Dip			No Dip
m AHD												
Purge												
pH			6.05			6.22			6.24			6.25
Temp			20.6			14			13.7			18
Cond (EC)			750			730			730			760
Salinity			370			370			360			380
ROP mv (Field)			336			294			377			369
Alkalinity (Field)			81			81			90			87
TTA			185			160			175			165
Do %S			20.9			21.2			22.5			34.7
Comments												
Al (filtered)			0.039			0.035			0.035			0.030
Al(Total)						0.045						
As						0.0005						
B												
Cd						<0.0001						
Ca												
Cr						<0.0001						
Co												
Cu												
Fe (Filtered)			31			36			35			39
Fe (Total)						41						
Pb												
Mn			0.58			0.63			0.59			0.60
Mg			11.6						14.4			13.9
Mercury												
Molybdenum												
Ni						0.020						
Se						<0.0002						
U												
Zn						0.046						
Fl as F												
CaCO3 (Acidity)			140			95			130			86
CaCO3 (Alkalinity)			50			65			74			29
Bicarbonate			50						74			29
Calcium			6.4						9.1			8.6
Carbonate												
NH3-N						0.030						
Total Nitrogen						0.033						
Cl			180			171			171			175
EC			692			668			699			655
O2						6.6						
Phosphate as PO4-P												
Total Phosphorus						0.90						
pH Lab			6.2			6.4			6.4			6.3
Potassium			8.7						10.3			9.7
Sodium			66.7						79.8			73.7
Sulphate			14			13			14			14
TDS			310			320			330			350
N												
Phos												

LOT552_BORE	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
Date			15/03/2021			14/06/20211			14/09/2021			7/12/2021
Casing Height above topo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Depth of bore	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
SWL (m)			No Dip			No Dip						
m AHD												
Purge												
pH			6.25			6.48			6.92			6.33
Temp			17.8			13.9			14.7			21.6
Cond (EC)			760			830			330			730
Salinity			380			410			160			360
ROP mv (Field)			375			388			321			403
Alkalinity (Field)			78			45			15			24
TTA			125			100			15			20
Do %S			24.5									
Comments												
Al (filtered)			0.036			0.023			0.017			0.014
Al(Total)												
As												
B												
Cd												
Ca												
Cr												
Co												
Cu												
Fe (Filtered)			40			37			0.062			0.082
Fe (Total)												
Pb												
Mn			0.63			0.63			0.009			0.31
Mg			14.7									13.6
Mercury												
Molybdenum												
Ni												
Se												
U												
Zn												
Fl as F												
CaCO3 (Acidity)			91			120			<2			24
CaCO3 (Alkalinity)			50			64			7			25
Bicarbonate			50									25
Calcium			8.5									10.9
Carbonate												
NH3-N												
Total Nitrogen												
Cl			174			173			81			169
EC			683			696			296			607
O2												
Phosphate as PO4-P												
Total Phosphorus												
pH Lab			6.4			6.2			6.8			6.7
Potassium			10.8									10.3
Sodium			80.5			73.3			39.4			77.5
Sulphate			14			14			6			13
TDS			350			360			160			290
N												
Phos												

LOT552_BORE	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
Date			10/03/202	20/04/202		23/06/202			28/09/202			15/12/202
Casing Height above topo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Depth of bore	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
SWL (m)												
m AHD												
Purge												
pH			5.09	6.8		6.85			6.98			5.9
Temp			24.8	20.3		15.9			19.5			19.3
Cond (EC)			900	650		550			330			770
Salinity			500	320		260			160			380
ROP mv (Field)			316	340		329			298			270
Alkalinity (Field)			30	30		21			54			90
TTA			20	20		20			30			180
Do %S												
Comments												
Al (filtered)			0.07	0.009		0.033			0.005			0.055
Al(Total)												
As												
B												
Cd												
Ca												
Cr												
Co												
Cu												
Fe (Filtered)			0.21	0.07		31			0.24			39
Fe (Total)												
Pb												
Mn			0.021	0.015		1.3			0.075			0.59
Mg			14.5	14		20.9			6.5			13.9
Mercury												
Molybdenum												
Ni												
Se												
U												
Zn												
Fl as F												
CaCO3 (Acidity)				5		4			2			100
CaCO3 (Alkalinity)				28		17			10			68
Bicarbonate				28		17			10			68
Calcium			12.5	12		8.4			5.1			8
Carbonate												
NH3-N												
Total Nitrogen												
Cl				174		132			79			176
EC				649		475			283			699
O2												
Phosphate as PO4-P												
Total Phosphorus												
pH Lab				7		7.1			6.9			6.1
Potassium			10.3	10.4		6.9			4.4			10.1
Sodium			88	85.3		60.1			43.4			80.4
Sulphate				14		10			6			14
TDS				320		240			130			380
N												
Phos												

BORE EASTERN BOUNDARY. NO PUMP OR WINDMILL. BASHFORD'S SOUTH WESTERN PADDOCKS. ARTESIAN FLOW FROM LEEDERVILLE. DIPPER HIT SLUDGE AT 11.M (10.65M BELOW TOPO). UNKNOWN TOTAL DEPTH. IRON STAINING ON CASING.
DEFUNCT TANK, will be able to put camera down this.

LOT667_WM1		Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17
Date						31/05/2017	29/06/2017	26/07/2017	16/08/2017	20/09/2017	18/10/2017	15/11/2017	18/12/2017
Casing Height above topo	m	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
Depth of bore	m	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00
SWL (m)	m (from top of casing)					0	0	0	0		0	0	0
m AHD						29.35	29.35	29.35	29.35	29.35	29.35	29.35	29.35
Purge	L						520	512			526	526	526
pH							5.74	5.92			5.75	5.87	5.89
Temp	degrees C						17.7	17.9			17.8	19.7	19.4
Cond (EC)	uS/cm						1260	1280			1400	1300	1370
Salinity	ppm						630	640			700	650	680
ROP mv (Field)							32	24			131	154	184
Alkalinity (Field)											72	90	45
TTA											275	295	210
Do %S								12.2			9.2	9.4	13.1
Comments										no access			
Al (filtered)	mg/L						0.084	0.075			0.12	0.061	0.080
Al(Total)	mg/L						9.7						0.26
As	mg/L						0.0002						0.0003
B	mg/L												
Cd	mg/L						<0.0001						<0.0001
Ca	mg/L												
Cr	mg/L						0.0001						<0.0001
Co	mg/L												
Cu	mg/L												
Fe (Filtered)	mg/L						32	33			34	34	34
Fe (Total)	mg/L						42						56
Pb	mg/L												
Mn	mg/L						1.3	1.3			1.4	1.3	1.3
Mg	mg/L							22.2			22.4	21.8	
Mercury	mg/L												
Molybdenum	mg/L												
Ni	mg/L						0.0059						0.0081
Se	mg/L						<0.0002						<0.0002
U	mg/L												
Zn	mg/L						0.040						0.048
Fl as F													
CaCO3 (Acidity)	mg/L						190	190			160	200	160
CaCO3 (Alkalinity)	mg/L						64	65			61	71	46
Bicarbonate								65			61	71	
Calcium								8.1			8	8	
Carbonate								<1			<1	<1	
NH3-N	mg/L						0.044						0.050
Total Nitrogen							0.16						0.61
Cl	mg/L						310	310			310	300	310
EC	uS/cm						1200	1190			1200	1220	1170
O2	mg/L						2.2						2.7
Phosphate as PO4-P	mg/L						<0.005						0.023
Total Phosphorus							0.52						8.1
pH Lab							6	6			5.8	5.9	5.8
Potassium								10.2			9.5	10.4	
Sodium								161			129	173	
Sulphate	mg/L						40	35			37	33	36
TDS	mg/L						660	640			650	620	626
N	mg/L												
Phos	mg/L												

LOT667_WM1		Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
Date		16/01/2018	14/02/2018	14/03/2018	17/04/2018	10/05/2018	14/06/2018	11/07/2018	13/08/2018	12/09/2018	10/10/2018	12/11/2018	11/12/2018
Casing Height above topo	m	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
Depth of bore	m	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00
SWL (m)	m (from top of casing)	0	0	0	0	0	0	0	0		0	0	0
m AHD		29.35	29.35	29.35	29.35	29.35	29.35	29.35	29.35		29.35	29.35	29.35
Purge	L	526	526	526	526	526	526	526					526
pH		5.66	5.81	5.74	5.63	5.66	5.73	5.69					5.59
Temp	degrees C	19.1	18.8	19.5	18.3	17.2	15.7	16.8					18.5
Cond (EC)	uS/cm	1460	1300	1320	1340	1350	1360	1370					1400
Salinity	ppm	730	650	660	670	670	680	690					700
ROP mv (Field)		213	215	259	295	304	319	377					252
Alkalinity (Field)		84	93	129	75	63	63	75					96
TTA		225	220	250	255	265	225	230					270
Do %S		9.8	10.8	9.1		8.1	14.7	14.6					16.8
Comments									Dip Only	No Access	Dip Only	Dip Only	
Al (filtered)	mg/L	0.081	0.048	0.040	0.049	0.038	0.047	0.033					0.067
Al(Total)	mg/L			2.5			0.54						
As	mg/L			0.0002			0.0003						
B	mg/L												
Cd	mg/L			<0.0001			<0.0001						
Ca	mg/L												
Cr	mg/L			<0.0001			<0.0001						
Co	mg/L												
Cu	mg/L												
Fe (Filtered)	mg/L	30	33	29	33	29	33	26					33
Fe (Total)	mg/L			45			42						
Pb	mg/L												
Mn	mg/L	1.2	1.3	1.1	1.3	1.1	1.3	1					1.3
Mg	mg/L	20.4	22.9		22.5	20.7		19.6					22.3
Mercury	mg/L												
Molybdenum	mg/L												
Ni	mg/L			0.0059			0.0087						
Se	mg/L			<0.0002			<0.0002						
U	mg/L												
Zn	mg/L			0.039			0.049						
Fl as F													
CaCO3 (Acidity)	mg/L	180	200	200	130	130	160	200					150
CaCO3 (Alkalinity)	mg/L	74	68	73	69	19	36	76					59
Bicarbonate		74	68		69	19		76					59
Calcium		7.4	7.8		8.2	7.2		7					7.8
Carbonate													
NH3-N	mg/L			0.097			0.031						
Total Nitrogen				0.1			0.29						
Cl	mg/L	310	320	320	320	310	330	320					300
EC	uS/cm	1210	1200	1200	1230	1170	1170	1220					1180
O2	mg/L			2.6			3.3						
Phosphate as PO4-P	mg/L			0.023			<0.005						
Total Phosphorus				0.46			0.48						
pH Lab		6	6	6	6.2	5.4	5.6	6					6
Potassium		9	10.5		11	8.3		9.5					9.7
Sodium		167	173		175	149		159					167
Sulphate	mg/L	46	39	36	36	36	34	34					37
TDS	mg/L	634	684	615	744	630	597	669					630
N	mg/L												
Phos	mg/L												

LOT667_WM1		Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
Date		14/01/2019	11/02/2019	14/03/2019	10/04/2019	8/05/2019	11/06/2019	12/07/2019	9/08/2019	10/09/2019	9/10/2019	12/11/2019	11/12/2019
Casing Height above topo	m	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
Depth of bore	m	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00
SWL (m)	m (from top of casing)	0	0	0	0	0	0	0	0	0	0	0	0
m AHD		29.35	29.35	29.35	29.35	29.35	29.35	29.35	29.35	29.35	29.35	29.35	29.35
Purge	L			526			526			528			528
pH				5.65			5.9			5.78			5.85
Temp	degrees C			18.3			16.1			18			19.2
Cond (EC)	uS/cm			1430			1300			1360			1510
Salinity	ppm			710			650			680			750
ROP mv (Field)				107			252			289			385
Alkalinity (Field)				90			87			51			90
TTA				250			220			235			250
Do %S				16			15.5			16.1			21.4
Comments		Dip Only	Dip Only		Dip Only	Dip Only		Dip Only	Dip Only		Dip Only	Dip Only	
Al (filtered)	mg/L			0.039			0.037			0.043			0.037
Al(Total)	mg/L						6.9						
As	mg/L						0.0003						
B	mg/L												
Cd	mg/L						<0.0001						
Ca	mg/L												
Cr	mg/L						<0.0001						
Co	mg/L												
Cu	mg/L												
Fe (Filtered)	mg/L			33			30			32			30
Fe (Total)	mg/L						51						
Pb	mg/L												
Mn	mg/L			1.2			1.2			1.3			1.2
Mg	mg/L			21.8						22.9			20.9
Mercury	mg/L												
Molybdenum	mg/L												
Ni	mg/L						0.0076						
Se	mg/L						<0.0002						
U	mg/L												
Zn	mg/L						0.055						
Fl as F													
CaCO3 (Acidity)	mg/L			240			150			77			180
CaCO3 (Alkalinity)	mg/L			19			56			21			52
Bicarbonate				19						21			52
Calcium				8.2						8.2			7.7
Carbonate													
NH3-N	mg/L						0.033						
Total Nitrogen							0.12						
Cl	mg/L			317			329			307			323
EC	uS/cm			1140			1190			1160			1150
O2	mg/L						3.7						
Phosphate as PO4-P	mg/L						<0.005						
Total Phosphorus							0.47						
pH Lab				5.6			6			5.8			5.9
Potassium				10.4						10.1			10.2
Sodium				164						170			160
Sulphate	mg/L			38			39			36			35
TDS	mg/L			610			800			610			620
N	mg/L												
Phos	mg/L												

LOT667_WM1		Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Date		13/01/2020	10/02/2020	10/03/2020	9/04/2020	11/05/2020	10/06/2020	10/07/2020	7/08/2020	10/09/2020	14/10/2020	10/11/2020	10/12/2020
Casing Height above topo	m	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
Depth of bore	m	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00
SWL (m)	m (from top of casing)	0	0	0	0	0	0	0	0	0	0	0	0
m AHD		29.35	29.35	29.35	29.35	29.35	29.35	29.35	29.35	29.35	29.35	29.35	29.35
Purge	L			264			264			264			264
pH				5.63			5.95			5.82			5.9
Temp	degrees C			19.1			17.4			16.2			19.3
Cond (EC)	uS/cm			1250			1240			1250			1410
Salinity	ppm			620			620			620			700
ROP mv (Field)				395			360			331			332
Alkalinity (Field)				75			72			87			72
TTA				230			220			220			190
Do %S				12.6			12.5			15.9			18.8
Comments		Dip Only	Dip Only		Dip Only	Dip Only		Dip Only	Dip Only		Dip Only	Dip Only	
Al (filtered)	mg/L			0.029			0.032			0.048			0.028
Al(Total)	mg/L						12						
As	mg/L						0.0003						
B	mg/L												
Cd	mg/L						<0.0001						
Ca	mg/L												
Cr	mg/L						<0.0001						
Co	mg/L												
Cu	mg/L												
Fe (Filtered)	mg/L			28			36			36			33
Fe (Total)	mg/L						55						
Pb	mg/L												
Mn	mg/L			1.1			1.2			1.3			1.3
Mg	mg/L			19.1						21.7			21.2
Mercury	mg/L												
Molybdenum	mg/L												
Ni	mg/L						0.0079						
Se	mg/L						<0.0002						
U	mg/L												
Zn	mg/L						0.054						
Fl as F													
CaCO3 (Acidity)	mg/L			180			140			190			130
CaCO3 (Alkalinity)	mg/L			55			56			77			35
Bicarbonate				55						77			35
Calcium				7.1						8			6.4
Carbonate													
NH3-N	mg/L						0.026						
Total Nitrogen							0.16						
Cl	mg/L			315			312			313			311
EC	uS/cm			1160			1170			1190			1140
O2	mg/L						3						
Phosphate as PO4-P	mg/L						<0.005						
Total Phosphorus							1.1						
pH Lab				5.9			6.1			6.1			5.8
Potassium				9						10.2			10
Sodium				152						167			156
Sulphate	mg/L			34			36			35			38
TDS	mg/L			630			610			570			610
N	mg/L												
Phos	mg/L												

LOT667_WM1		Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
Date		15/01/2021	10/02/2021	17/03/2021	1/04/2021	5/05/2021	10/06/2021	8/07/2021	9/08/2021	6/09/2021	12/10/2021	1/11/2021	8/12/2021
Casing Height above topo	m	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
Depth of bore	m	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00
SWL (m)	m (from top of casing)	0	0	0	0	0	0	0	0	0	0	0	0
m AHD		29.35	29.35	29.35	29.35	29.35	29.35	29.35	29.35	29.35	29.35	29.35	29.35
Purge	L			264			264						248
pH				5.67			5.91						5.92
Temp	degrees C			19.6			18.9						21.5
Cond (EC)	uS/cm			1300			1370						1330
Salinity	ppm			650			680						660
ROP mv (Field)				392			399						442
Alkalinity (Field)				75			87						90
TTA				205			230						185
Do %S				13.4									
Comments		Dip Only	Dip Only		Dip Only	Dip Only		Dip Only	Dip Only	no access	dip only	dip only	
Al (filtered)	mg/L			0.035			0.14						
Al(Total)	mg/L												0.067
As	mg/L												
B	mg/L												
Cd	mg/L												
Ca	mg/L												
Cr	mg/L												
Co	mg/L												
Cu	mg/L												
Fe (Filtered)	mg/L			25			33						33
Fe (Total)	mg/L												
Pb	mg/L												
Mn	mg/L			1.3			1.3						1.3
Mg	mg/L			22.5									22.1
Mercury	mg/L												
Molybdenum	mg/L												
Ni	mg/L												
Se	mg/L												
U	mg/L												
Zn	mg/L												
Fl as F													
CaCO3 (Acidity)	mg/L			140			120						180
CaCO3 (Alkalinity)	mg/L			76			27						40
Bicarbonate				76									40
Calcium				8.3									8.3
Carbonate													
NH3-N	mg/L												
Total Nitrogen													
Cl	mg/L			319			321						315
EC	uS/cm			1260			1150						1190
O2	mg/L												
Phosphate as PO4-P	mg/L												
Total Phosphorus													
pH Lab				6			5.8						5.9
Potassium				11.3									10.8
Sodium				169			171						164
Sulphate	mg/L			35			36						36
TDS	mg/L			660			590						590
N	mg/L												
Phos	mg/L												

LOT667_WM1		Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
Date		6/01/2022	9/02/2022	3/03/2022	7/04/2022	12/05/2022	14/06/2022	19/07/2022	13/08/2022	14/09/2022	29/10/2022	22/11/2022	30/11/2022
Casing Height above topo	m	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
Depth of bore	m	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00
SWL (m)	m (from top of casing)	0	0	0	0	0	0	0	0	0	0	0	0
m AHD		29.35	29.35	29.35	29.35	29.35	29.35	29.35	29.35	29.35	29.35	29.35	29.35
Purge	L			264			264						260
pH				5.86			5.77						5.7
Temp	degrees C			18			18.2						22.1
Cond (EC)	uS/cm			1520			1300						1300
Salinity	ppm			760			650						650
ROP mv (Field)				585			263						320
Alkalinity (Field)				75			75						90
TTA				200			280						200
Do %S													
Comments		dip only	dip only		dip only	dip only		dip only	dip only	no access	dip only	dip only	
Al (filtered)	mg/L												
Al(Total)	mg/L			0.063			0.033						0.11
As	mg/L												
B	mg/L												
Cd	mg/L												
Ca	mg/L												
Cr	mg/L												
Co	mg/L												
Cu	mg/L												
Fe (Filtered)	mg/L			32			31						20
Fe (Total)	mg/L												
Pb	mg/L												
Mn	mg/L			1.3			1.3						1.3
Mg	mg/L			21.9			20.9						23.6
Mercury	mg/L												
Molybdenum	mg/L												
Ni	mg/L												
Se	mg/L												
U	mg/L												
Zn	mg/L												
Fl as F													
CaCO3 (Acidity)	mg/L			160			180						140
CaCO3 (Alkalinity)	mg/L			26			51						69
Bicarbonate				26			51						69
Calcium				8.1			7.9						9
Carbonate													
NH3-N	mg/L												
Total Nitrogen													
Cl	mg/L			309			323						324
EC	uS/cm			1160			1190						1220
O2	mg/L												
Phosphate as PO4-P	mg/L												
Total Phosphorus													
pH Lab				5.7			5.8						6.5
Potassium				14.1			10.3						12.3
Sodium				166			158						192
Sulphate	mg/L			36			36						36
TDS	mg/L			570			610						610
N	mg/L												
Phos	mg/L												

LOT668_BORE. HOUSE bore-OWNED SLADE+PARKIN-23/01/2012. UNABLE TO DIP FULL DEPTH 1/6/17. DEPTH FROM DOW DATABASE. NO PUMP IN THIS BORE IN JUNE 2017.

Can put camera down this bore - unused with rock on top

23073124		Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
Date						1/06/2017	29/06/2017	26/07/2017	15/08/2017	20/09/2017	18/10/2017	15/11/2017	14/12/2017	15/01/2018	13/02/2018	13/03/2018	16/04/2018	9/05/2018	13/06/2018	11/07/2018	13/08/2018	11/09/2018	10/10/2018	12/11/2018	10/12/2018
Casing Height above topo	m	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Depth of bore	m	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00
SWL (m)	m (from top of casing)					11.02	10.1	9.38	8.79	8.54	8.82	11.16	11.9	13.09	13.64	13.86	12.51	12.14	10.87	9.38	8.5	8.14	8.08	10.18	11.56
m AHD						17.08	18.00	18.72	19.31	19.56	19.28	16.94	16.20	15.01	14.46	14.24	15.59	15.96	17.23	18.72	19.60	19.96	20.02	17.92	16.54
Purge	L																								
pH																									
Temp	degrees C																								
Cond (EC)	uS/cm																								
Salinity	ppm																								
ROP mv (Field)																									
Alkalinity (Field)																									
TTA																									
Do %S																									
Comments						Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only
Al (filtered)	mg/L																								
Al(Total)	mg/L																								
As	mg/L																								
B	mg/L																								
Cd	mg/L																								
Ca	mg/L																								
Cr	mg/L																								
Co	mg/L																								
Cu	mg/L																								
Fe (Filtered)	mg/L																								
Fe (Total)	mg/L																								
Pb	mg/L																								
Mn	mg/L																								
Mg	mg/L																								
Mercury	mg/L																								
Molybdenum	mg/L																								
Ni	mg/L																								
Se	mg/L																								
U	mg/L																								
Zn	mg/L																								
Fl as F																									
$CaCO_3$ (Acidity)	mg/L																								
$CaCO_3$ (Alkalinity)	mg/L																								
Bicarbonate																									
Calcium																									
Carbonate																									
NH_3-N	mg/L																								
Total Nitrogen																									
Cl	mg/L																								
EC	uS/cm																								
O_2	mg/L																								
Phosphate as PO_4-P	mg/L																								
Total Phoshorus																									
pH Lab																									
Potassium																									
Sodium																									
Sulphate	mg/L																								
TDS	mg/L																								
N	mg/L																								
Phos	mg/L																								

23073124		Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Date		14/01/2019	11/02/2019	11/03/2019	10/04/2019	8/05/2019	12/06/2019	11/07/2019	9/08/2019	11/09/2019	9/10/2019	12/11/2019	9/12/2019	9/01/2020	10/02/2020	11/03/2020	9/04/2020	11/05/2020	10/06/2020	10/07/2020	7/08/2020	8/09/2020	14/10/2020	10/11/2020	9/12/2020
Casing Height above topo	m	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Depth of bore	m	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00
SWL (m)	m (from top of casing)	13.86	13.85	13.9	13.16	11.66	10.9	9.63	9.9	8.55	8.69	10.62	12.59	12.3	12.93	14.75	15.12	11.83	10.52	9.64	8.91	8.45	8.52	11.1	12.6
m AHD		14.24	14.25	14.20	14.20	14.94	16.44	17.20	18.47	18.20	19.55	19.41	17.48	15.51	15.80	15.17	13.35	12.98	16.27	17.58	18.46	19.19	19.65	19.58	17.00
Purge	L																								
pH																									
Temp	degrees C																								
Cond (EC)	uS/cm																								
Salinity	ppm																								
ROP mv (Field)																									
Alkalinity (Field)																									
TTA																									
Do %S																									
Comments		Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only
Al (filtered)	mg/L																								
Al(Total)	mg/L																								
As	mg/L																								
B	mg/L																								
Cd	mg/L																								
Ca	mg/L																								
Cr	mg/L																								
Co	mg/L																								
Cu	mg/L																								
Fe (Filtered)	mg/L																								
Fe (Total)	mg/L																								
Pb	mg/L																								
Mn	mg/L																								
Mg	mg/L																								
Mercury	mg/L																								
Molybdenum	mg/L																								
Ni	mg/L																								
Se	mg/L																								
U	mg/L																								
Zn	mg/L																								
Fl as F																									
$CaCO_3$ (Acidity)	mg/L																								
$CaCO_3$ (Alkalinity)	mg/L																								
Bicarbonate																									
Calcium																									
Carbonate																									
NH_3-N	mg/L																								
Total Nitrogen																									
Cl	mg/L																								
EC	uS/cm																								
O_2	mg/L																								
Phosphate as PO_4-P	mg/L																								
Total Phoshorus																									
pH Lab																									
Potassium																									
Sodium																									
Sulphate	mg/L																								
TDS	mg/L																								
N	mg/L																								
Phos	mg/L																								

23073124		Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
Date		15/01/2021	10/02/2021	15/03/2021	1/04/2021	5/05/2021	14/06/2021	6/07/2021	3/08/2021	7/09/2021	15/10/2021	1/11/2021	7/12/2021	6/01/2022	3/02/2022	9/03/2020	7/04/2022	12/05/2022	30/06/2022	26/07/2022	30/08/2022	28/09/2022	20/10/2022	22/11/2022	15/12/2022
Casing Height above topo	m	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Depth of bore	m	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00	69.00
SWL (m)	m (from top of casing)	15.8	14.78	14.25	14	12.52	10.36	9.52	8.7	8.26	8.15	8.44	10.23	11.3	12.27	12.26	11.43	11.69	10.19	9.5	8.8	8.54	8.44	8.89	10.64
m AHD		15.50	12.30	13.32	13.85	14.10	15.58	17.74	18.58	19.40	19.84	19.95	19.66	17.87	16.80	15.83	15.84	16.67	16.41	17.91	18.60	19.30	19.56	19.66	19.21
Purge	L																								
pH																									
Temp	degrees C																								
Cond (EC)	uS/cm																								
Salinity	ppm																								
ROP mv (Field)																									
Alkalinity (Field)																									
TTA																									
Do %S																									
Comments		Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only	Dip only
Al (filtered)	mg/L																								
Al(Total)	mg/L																								
As	mg/L																								
B	mg/L																								
Cd	mg/L																								
Ca	mg/L																								
Cr	mg/L																								
Co	mg/L																								
Cu	mg/L																								
Fe (Filtered)	mg/L																								
Fe (Total)	mg/L																								
Pb	mg/L																								
Mn	mg/L																								
Mg	mg/L																								
Mercury	mg/L																								
Molybdenum	mg/L																								
Ni	mg/L																								
Se	mg/L																								
U	mg/L																								
Zn	mg/L																								
Fl as F																									
$CaCO_3$ (Acidity)	mg/L																								
$CaCO_3$ (Alkalinity)	mg/L																								
Bicarbonate																									
Calcium																									
Carbonate																									
NH_3-N	mg/L																								
Total Nitrogen																									
Cl	mg/L																								
EC	uS/cm																								
O_2	mg/L																								
Phosphate as PO_4-P	mg/L																								
Total Phoshorus																									
pH Lab																									
Potassium																									
Sodium																									
Sulphate	mg/L																								
TDS	mg/L																								
N	mg/L																								
Phos	mg/L																								

LOT668_BORE. HOUSE bore-OWNED SLADE+PARKIN-ACTIVELY PUMPED FOR HOUSE
House Bore - No camera access.

LOT668_BORE2		Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17
Date						1/06/2017	29/06/2017	26/07/2017	15/08/2017	20/09/2017	18/10/2017	15/11/2017	14/12/2017
Casing Height above topo	m	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Depth of bore	m	25.30	25.30	25.30	25.30	25.30	25.30	25.30	25.30	25.30	25.30	25.30	25.30
SWL (m)	m (from top of casing)					11.27	10.5	9.68	9.05		9.11	11.52	12.16
m AHD						16.98	17.75	18.57	19.20		19.14	16.73	16.09
Purge	L												
pH							6.17	6.47	6.16	5.97	6.28	6.34	6.15
Temp	degrees C						15.5	17.6	16.8	17.1	16	17.5	21.1
Cond (EC)	uS/cm						1140	1150	1180	1230	1270	1170	1240
Salinity	ppm						570	580	590	620	640	590	620
ROP mv (Field)							2	24	96	105	147	178	196
Alkalinity (Field)										105	84	87	102
TTA										235	132	138	150
Do %S								36.2	28.8	26.1	27.6	24.4	35.2
Comments						Dip only							
Al (filtered)	mg/L						0.049	0.056	0.042	0.007	0.041	0.036	0.042
Al(Total)	mg/L						0.055			0.049			0.049
As	mg/L						0.0003			0.0004			0.0003
B	mg/L												
Cd	mg/L						<0.0001			<0.0001			<0.0001
Ca	mg/L												
Cr	mg/L						<0.0001			<0.0001			<0.0001
Co	mg/L												
Cu	mg/L												
Fe (Filtered)	mg/L						23	23	23	23	23	24	20
Fe (Total)	mg/L						25			26			22
Pb	mg/L												
Mn	mg/L						0.74	0.74	0.76	0.80	0.78	0.079	0.69
Mg	mg/L							23.9	23.8		24.8	25.6	
Mercury	mg/L												
Molybdenum	mg/L												
Ni	mg/L						0.0029			0.0040			0.0029
Se	mg/L						<0.0002			<0.0002			<0.0002
U	mg/L												
Zn	mg/L						0.005			0.013			0.010
Fl as F													
CaCO3 (Acidity)	mg/L						83	70	110	69	60	89	63
CaCO3 (Alkalinity)	mg/L						74	59	74	62	65	78	51
Bicarbonate								59	74		65	78	
Calcium								4.8	4.7		5.1	5.3	
Carbonate								<1	<1		<1	<1	
NH3-N	mg/L						0.061			0.055			0.050
Total Nitrogen							0.092			0.088			0.097
Cl	mg/L						270	280	270	280	270	270	280
EC	uS/cm						1100	1040	1090	1080	1060	1100	1060
O2	mg/L						8.1			7.7			7.6
Phosphate as PO4-P	mg/L						0.015			0.009			0.022
Total Phoshorus							0.097			0.27			0.17
pH Lab							6.5	6.5	6.3	6.4	6.4	6.4	6.2
Potassium								7.2	7.2		6.7	7.4	
Sodium								141	118		120	161	
Sulphate	mg/L						36	31	32	33	32	28	34
TDS	mg/L						610	560	530	590	560	570	540
N	mg/L												
Phos	mg/L												

LOT668_BORE2	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
Date	15/01/2018	13/02/2018	13/03/2018	16/04/2018	9/05/2018	13/06/2018	11/07/2018	13/08/2018	11/09/2018	10/10/2018	12/11/2018	10/12/2018
Casing Height above topo	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Depth of bore	25.30	25.30	25.30	25.30	25.30	25.30	25.30	25.30	25.30	25.30	25.30	25.30
SWL (m)	13.43	14.01	14.23	12.94	12.44	10.82	9.64	8.74	8.39	8.37	10.49	11.91
m AHD	14.82	14.24	14.02	15.31	15.81	17.43	18.61	19.51	19.86	19.88	17.76	16.34
Purge												
pH	6.15	6.2	6.17	6.1	6.15	6.1			6.22			6.07
Temp	20.7	18.6	20.1	17.7	16.6	16.3			15.5			18.6
Cond (EC)	1280	1170	1150	1160	1150	1200			1240			1220
Salinity	640	590	580	580	570	600			620			610
ROP mv (Field)	224	237	295	272	255	309			105			153
Alkalinity (Field)	90	81	126	78	60	81			84			99
TTA	130	135	140	140	145	105			120			140
Do %S	29.2	34.6	29.6		30.4	28.8			31.5			29.7
Comments							Dip Only	Dip Only		Dip Only	Dip Only	
Al (filtered)	0.036	0.024	0.026	0.021	0.025	0.023			0.024			0.026
Al(Total)			0.096			0.027						
As			0.0003			0.0004						
B												
Cd			<0.0001			<0.0001						
Ca												
Cr			<0.0001			0.0001						
Co												
Cu												
Fe (Filtered)	20	20	22	22	23	18			21			21
Fe (Total)			27			22						
Pb												
Mn	0.68	0.66	0.74	0.73	0.75	0.63			0.73			0.74
Mg	22.4	25		24.1	25.5				23.7			24
Mercury												
Molybdenum												
Ni			0.0033			0.0039						
Se			<0.0002			<0.0002						
U												
Zn			0.009			0.015						
Fl as F												
CaCO3 (Acidity)	82	71	87	60	72	68			63			95
CaCO3 (Alkalinity)	68	72	67	68	65	62			71			78
Bicarbonate	68	72		68	65				71			78
Calcium	4.5	5		5.1	5.4				5.2			5.2
Carbonate												
NH3-N			0.058			0.048						
Total Nitrogen			0.11			0.18						
Cl	270	290	260	290	280	290			280			274
EC	1080	972	1070	1090	1090	1090			1090			1130
O2			7.1			8.2						
Phosphate as PO4-P			0.009			0.005						
Total Phoshorus			0.25			0.21						
pH Lab	6.3	6.4	6.2	6.4	6.4	6.4			6.4			6.4
Potassium	5.9	7.4		7.6	7.4				6.7			7
Sodium	135	159		149	155				146			146
Sulphate	41	37	33	32	33	31			33			33
TDS	582	594	544	480	584	591			549			630
N												
Phos												

LOT668_BORE2	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
Date	14/01/2019	11/02/2019	11/03/2019	10/04/2019	8/05/2019	12/06/2019	11/07/2019	9/08/2019	11/09/2019	9/10/2019	12/11/2019	9/12/2019
Casing Height above topo	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Depth of bore	25.30	25.30	25.30	25.30	25.30	25.30	25.30	25.30	25.30	25.30	25.30	25.30
SWL (m)	15.47	14.2	14.23	13.48	11.93	11.17	9.87	9.34	10.33	8.94	10.96	12.94
m AHD	12.78	14.05	14.02	14.77	16.32	17.08	18.38	18.91	17.92	19.31	17.29	15.31
Purge												
pH			6.25			6.28			6.2			6.29
Temp			18			15.8			18.7			18.9
Cond (EC)			1220			1150			1220			1280
Salinity			610			570			610			640
ROP mv (Field)			148			244			255			261
Alkalinity (Field)			90			69			66			60
TTA			115			110			125			130
Do %S			35.6			28.1			36.4			35.4
Comments	Dip Only	Dip Only		Dip Only	Dip Only		Dip Only	Dip Only		Dip Only	Dip Only	
Al (filtered)			0.023			0.014			0.020			0.022
Al(Total)						0.034						
As						0.0002						
B												
Cd						<0.0001						
Ca												
Cr						0.0002						
Co												
Cu												
Fe (Filtered)			22			15			18			22
Fe (Total)						22						
Pb												
Mn			0.69			0.66			0.60			0.69
Mg			24.1						20.8			23.3
Mercury												
Molybdenum												
Ni						0.0043						
Se						<0.0002						
U												
Zn						0.023						
Fl as F												
CaCO3 (Acidity)			51			52			38			85
CaCO3 (Alkalinity)			43			44			47			62
Bicarbonate			43						47			62
Calcium			5.2						4.6			5
Carbonate												
NH3-N						0.019						
Total Nitrogen						0.11						
Cl			276			278			267			288
EC			1020			1080			1040			1100
O2						7.1						
Phosphate as PO4-P												
Total Phoshorus						0.15						
pH Lab			6.4			6.6			6.4			6.4
Potassium			7.6						6.7			6.9
Sodium			155						143			146
Sulphate			36			32			32			34
TDS			550			630			530			580
N												
Phos												

LOT668_BORE2	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Date	9/01/2020	10/02/2020	11/03/2020	9/04/2020	11/05/2020	10/06/2020	10/07/2020	7/08/2020	8/09/2020	14/10/2020	10/11/2020	9/12/2020
Casing Height above topo	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Depth of bore	25.30	25.30	25.30	25.30	25.30	25.30	25.30	25.30	25.30	25.30	25.30	25.30
SWL (m)	12.62	13.32	15.12	15.12	12.09	10.77	9.89	9.15	8.7	8.77	11.45	12.97
m AHD	15.63	14.93	13.13	13.13	16.16	17.48	18.36	19.10	19.55	19.48	16.80	15.28
Purge												
pH			6.18			6.38			6.34			6.28
Temp			19.4			16.3			15.7			18.9
Cond (EC)			1110			1120			1090			1120
Salinity			550			560			540			560
ROP mv (Field)			330			303			338			358
Alkalinity (Field)			75			54			90			81
TTA			115			110			105			120
Do %S			31.4			26.4			26.5			34.1
Comments	Dip Only	Dip Only		Dip Only	Dip Only		Dip Only	Dip Only		Dip Only	Dip Only	
Al (filtered)			0.019			0.022			0.027			0.013
Al(Total)						0.039						
As						0.0004						
B												
Cd						<0.0001						
Ca												
Cr						<0.0001						
Co												
Cu												
Fe (Filtered)			18			23			23			22
Fe (Total)						24						
Pb												
Mn			0.61			0.78			0.74			0.69
Mg			20.1						23.4			22.8
Mercury												
Molybdenum												
Ni						0.0041						
Se						<0.0002						
U												
Zn						0.009						
Fl as F												
CaCO3 (Acidity)			81			61			74			56
CaCO3 (Alkalinity)			66			70			68			58
Bicarbonate			66						68			57
Calcium			4						5.1			5.3
Carbonate												
NH3-N						0.048						
Total Nitrogen						0.085						
Cl			286			282			277			282
EC			1080			1080			1060			1040
O2						7.8						
Phosphate as PO4-P												
Total Phoshorus						0.16						
pH Lab			6.4			6.5			6.5			6.5
Potassium			6.3						7.3			6.9
Sodium			134						151			142
Sulphate			33			33			33			35
TDS			540			570			540			560
N												
Phos												

LOT668_BORE2	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
Date	15/01/2021	10/02/2021	15/03/2021	1/04/2021	5/05/2021	14/06/2021	6/07/2021	3/08/2021	7/09/2021	15/10/2021	1/11/2021	7/12/2021
Casing Height above topo	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Depth of bore	25.30	25.30	25.30	25.30	25.30	25.30	25.30	25.30	25.30	25.30	25.30	25.30
SWL (m)	16.21	15.11	14.61	14.33	12.81	10.61	9.77	8.96	8.57	8.42	8.7	10.5
m AHD	12.04	13.14	13.64	13.92	15.44	17.64	18.48	19.29	19.68	19.83	19.55	17.75
Purge												
pH			6.18			6.38			6.26			6.14
Temp			20.1			15.4			16.9			18.9
Cond (EC)			1160			1210			1190			1220
Salinity			580			600			600			610
ROP mv (Field)			365			378			335			431
Alkalinity (Field)			90			93			63			93
TTA			140			145			110			135
Do %S			31.7									
Comments	Dip Only	Dip Only		Dip Only	Dip Only		Dip Only	Dip Only		Dip Only	Dip Only	
Al (filtered)			0.024			0.011			0.014			0.034
Al(Total)												
As												
B												
Cd												
Ca												
Cr												
Co												
Cu												
Fe (Filtered)			24			23			24			22
Fe (Total)												
Pb												
Mn			0.76			0.74			0.76			0.74
Mg			25.5									23.9
Mercury												
Molybdenum												
Ni												
Se												
U												
Zn												
Fl as F												
CaCO3 (Acidity)			73			97			91			120
CaCO3 (Alkalinity)			67			80			75			65
Bicarbonate			67									65
Calcium			5.4									5.4
Carbonate												
NH3-N												
Total Nitrogen												
Cl			280			280			283			286
EC			1100			1120			1120			1090
O2												
Phosphate as PO4-P												
Total Phoshorus												
pH Lab			6.6			6.4			6.4			6.4
Potassium			8.3									8.1
Sodium			154			147			152			146
Sulphate			33			34			32			32
TDS			550			580			560			500
N												
Phos												

LOT668_BORE2	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
Date	6/01/2021	3/02/2022	9/03/2022	7/04/2022	12/05/2022	30/06/2022	26/07/2022	30/08/2022	28/09/2022	20/10/2022	22/11/2022	15/12/2022
Casing Height above topo	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Depth of bore	25.30	25.30	25.30	25.30	25.30	25.30	25.30	25.30	25.30	25.30	25.30	25.30
SWL (m)	11.67	12.66	14.85	12.18	11.56	10.35	9.312	9.01	9.07	9.01	9.44	10.86
m AHD	16.58	15.59	13.40	16.07	16.69	17.90	18.94	19.24	12.80	12.80	12.80	12.80
Purge												
pH			5.92				6.4		6.44			6.04
Temp			21				18.2		18			18.8
Cond (EC)			1350				1890		590			750
Salinity			680				950		295			330
ROP mv (Field)			340				283		330			280
Alkalinity (Field)			90				45		75			60
TTA			200				200		120			170
Do %S												
Comments	Dip Only	Dip Only		Dip Only	Dip Only	Dip Only		Dip Only		Dip Only	Dip Only	
Al (filtered)			0.023				0.048		0.016			0.032
Al(Total)												
As												
B												
Cd												
Ca												
Cr												
Co												
Cu												
Fe (Filtered)			22				22		1.7			23
Fe (Total)												
Pb												
Mn			0.75				0.75		0.18			0.74
Mg			24				26		26.9			24
Mercury												
Molybdenum												
Ni												
Se												
U												
Zn												
Fl as F												
CaCO3 (Acidity)			110				65		51			57
CaCO3 (Alkalinity)			81				54		43			67
Bicarbonate			81				54		43			67
Calcium			5				6.6		5.7			5.1
Carbonate												
NH3-N												
Total Nitrogen												
Cl			278				277		290			287
EC			1120				1050		1080			1100
O2												
Phosphate as PO4-P												
Total Phoshorus												
pH Lab			6.4				6.4		6.1			6.3
Potassium			7.6				8.1		8.2			7.9
Sodium			146				161		162			166
Sulphate			33				32		33			33
TDS			540				530		510			530
N												
Phos												

Slades House (Kitchen)		15/06/2021
	Field Ph	6.9
	Field Ec	1170
	Field TDS	530
	Field Alk	45
	Field TTA	10
	Field ROP	381
Lab	Al (filtered)	<0.005
	Al(Total)	<0.005
	As	<0.0001
	Cd	<0.0001
	Cr	<0.0001
	Fe (Filtered)	<0.005
	Fe (Total)	<0.005
	Mn	<0.001
	Ni	0.0006
	Se	<0.0002
	Zn	0.019
	CaCO3 (Acid	11
	CaCO3 (Alk)	39
	NH3-N	<0.010
	Total Nitrog	0.039
	Cl	279
	EC	1030
	O2	11
	Total Phos	<0.005
	pH Lab	7
	Sulphate	32
	TDS	560

Heterotrophic Plate count 35C	5
Total Coliforms	<1
Thermotolerant Coliforms	<1
E.coli	<1

LOT758_BORE. --WEST OF shed, W OF HOUSE. ~30m deep. Iron filter on tanks stand. Need to lift bore and pipes to dip
McLeay House bore - no access for camera or dipping

LOT758_BORE		Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17
Date						31/05/2017	27/06/2017	27/07/2017	15/08/2017	21/09/2017	17/10/2017	14/11/2017	14/12/2017
Casing Height above topo	m	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Depth of bore	m	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
SWL (m)	m (from top of casing)					7.86							
m AHD						17.45							
Purge	L						no dip						
pH								6.3	6.14	6.0	6.15	6.57	6.3
Temp	degrees C							17.2	16.6	17.3	18.3	20.9	21.6
Cond (EC)	uS/cm							1110	1200	1200	1210	1030	1130
Salinity	ppm							560	600	600	600	510	560
ROP mv (Field)								0	66	104	117	126	185
Alkalinity (Field)										63	84	78	78
TTA										254	135	135	128
Do %S								14.9	19.5	11.6	20.5	15.9	25.7
Comments													
Al (filtered)	mg/L							0.051	0.047	0.042	0.040	0.033	0.040
Al(Total)	mg/L							0.058		0.043			0.039
As	mg/L							0.0001		0.0008			0.0007
B	mg/L												
Cd	mg/L							<0.0001		<0.0001			<0.0001
Ca	mg/L												
Cr	mg/L							<0.0001		<0.0001			<0.0001
Co	mg/L												
Cu	mg/L												
Fe (Filtered)	mg/L							24	27	24	24	19	19
Fe (Total)	mg/L							25		29			19
Pb	mg/L												
Mn	mg/L							0.78	0.84	0.85	0.79	0.67	0.66
Mg	mg/L								23.5		21.5	18.9	
Mercury	mg/L												
Molybdenum	mg/L												
Ni	mg/L							0.0082		0.0035			0.0020
Se	mg/L							<0.0002		<0.0002			<0.0002
U	mg/L												
Zn	mg/L							0.023		0.016			0.007
Fl as F													
CaCO3 (Acidity)	mg/L							45	90	39	52	53	54
CaCO3 (Alkalinity)	mg/L							32	47	29	50	41	23
Bicarbonate									47		50	41	
Calcium									5.5		5.4	4.7	
Carbonate									<1		<1	<1	
Total Nitrogen								0.035		0.15			<0.025
Phosphate as PO4-P								<0.005		<0.005			0.011
NH3-N	mg/L							<0.010		0.036			0.027
Cl	mg/L							270	280	280	270	250	290
EC	uS/cm							1010	1050	980	993	932	1030
O2	mg/L							4.3		3			4.8
P	mg/L												
pH Lab								6.3	6.2	6.1	6.3	6.2	5.8
Potassium									6.2		6.1	5.8	
Sodium									119		114	130	
Sulphate	mg/L							22	24	23	22	21	25
TDS	mg/L							540	530	550	500	480	530
N	mg/L												
Phos	mg/L							0.093		0.13			0.15

LOT758_BORE		Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
Date		15/01/2018	13/02/2018	13/03/2018	16/04/2018	9/05/2018	13/06/2018			11/09/2018			10/12/2018
Casing Height above topo	m	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Depth of bore	m	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
SWL (m)	m (from top of casing)							No Dip	No Dip		No Dip	No Dip	
m AHD													
Purge	L												
pH		6.2	6.22	6.15	6.1	6.1	6.12			6.28			6.05
Temp	degrees C	20.6	19.3	20.6	19.4	17.6	16.8			16.1			19.9
Cond (EC)	uS/cm	1250	1060	1050	1060	1050	1070			1170			1120
Salinity	ppm	630	530	530	530	530	530			590			560
ROP mv (Field)		200	213	245	249	244	296			50			149
Alkalinity (Field)		75	75	87	78	54	54			81			66
TTA		125	120	145	140	140	120			120			125
Do %S		19.6	24.3	21.5		22.9	20			28.5			32.4
Comments													
Al (filtered)	mg/L	0.033	0.026	0.032	0.022	0.024	0.021			0.024			0.026
Al(Total)	mg/L			0.074			0.022						
As	mg/L			0.0007			0.0008						
B	mg/L												
Cd	mg/L			<0.0001			<0.0001						
Ca	mg/L												
Cr	mg/L			<0.0001			<0.0001						
Co	mg/L												
Cu	mg/L												
Fe (Filtered)	mg/L	19	22	23	22	23	18			23			22
Fe (Total)	mg/L			27			19						
Pb	mg/L												
Mn	mg/L	0.65	0.73	0.76	0.75	0.76	0.63			0.76			0.75
Mg	mg/L	18.1	22.1		20.9	21.4				21			21.2
Mercury	mg/L												
Molybdenum	mg/L												
Ni	mg/L			0.0026			0.0029						
Se	mg/L			<0.0002			<0.0002						
U	mg/L												
Zn	mg/L			0.009			0.008						
Fl as F													
CaCO3 (Acidity)	mg/L	75	60	78	49	67	69			75			75
CaCO3 (Alkalinity)	mg/L	46	47	39	39	55	46			63			47
Bicarbonate		46	47		39	55				63			47
Calcium		4.5	5		5	5.2				5.1			5
Carbonate													
Total Nitrogen				0.038			0.12						
Phosphate as PO4-P				0.010			<0.005						
NH3-N	mg/L			0.055			0.02						
Cl	mg/L	270	270	250	280	170	280			260			274
EC	uS/cm	997	890	982	1020	1010	1020			1030			1060
O2	mg/L			4.2			5.1						5
P	mg/L												
pH Lab		6.1	6.3	6	6.2	6.4	6.3			6.4			6.3
Potassium		5.1	6.8		6.3	5.9				5.4			5.5
Sodium		121	149		138	139				136			133
Sulphate	mg/L	28	25	24	24	15	22			22			24
TDS	mg/L	504	500	507	462	532	474			518			600
N	mg/L												
Phos	mg/L			0.14			0.085						

LOT758_BORE		Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
Date				11/03/2019			12/06/2019			11/09/2019			9/12/2019
Casing Height above topo	m	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Depth of bore	m	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
SWL (m)	m (from top of casing)	No Dip	No Dip	No Dip			No Dip			No Dip			No Dip
m AHD													
Purge	L												
pH				6.27			6.25			6.2			6.17
Temp	degrees C			20.1			18.6			19.3			19.8
Cond (EC)	uS/cm			1180			1200			1210			1160
Salinity	ppm			590			600			610			580
ROP mv (Field)				111			192			235			255
Alkalinity (Field)				63			75			60			69
TTA				150			125			135			130
Do %S				38.8			17.6			31.4			30.3
Comments													
Al (filtered)	mg/L			0.025			0.028			0.024			0.022
Al(Total)	mg/L						0.035						
As	mg/L						0.0008						
B	mg/L												
Cd	mg/L						<0.0001						
Ca	mg/L												
Cr	mg/L						<0.0001						
Co	mg/L												
Cu	mg/L												
Fe (Filtered)	mg/L			23			23			22			22
Fe (Total)	mg/L						27						
Pb	mg/L												
Mn	mg/L			0.74			0.72			0.72			0.72
Mg	mg/L			21.6						20.9			20.1
Mercury	mg/L												
Molybdenum	mg/L												
Ni	mg/L						0.036						
Se	mg/L						<0.0002						
U	mg/L												
Zn	mg/L						0.008						
Fl as F													
CaCO3 (Acidity)	mg/L			43			82			36			84
CaCO3 (Alkalinity)	mg/L			25			54			26			55
Bicarbonate				25						26			55
Calcium				5.3						5			
Carbonate													
Total Nitrogen							0.062						
Phosphate as PO4-P													
NH3-N	mg/L						0.031						
Cl	mg/L			265			272			258			271
EC	uS/cm			954			1060			985			1000
O2	mg/L						5.6						4.9
P	mg/L												
pH Lab				6.2			6.3			6.2			6.4
Potassium				6.2						5.9			6.2
Sodium				141						138			132
Sulphate	mg/L			25			24			21			22
TDS	mg/L			550			570			480			490
N	mg/L												
Phos	mg/L						0.092						

LOT758_BORE		Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Date				11/03/2020			15/06/2020			8/09/2020			9/12/2020
Casing Height above topo	m	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Depth of bore	m	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
SWL (m)	m (from top of casing)			No Dip			No Dip			No Dip			No Dip
m AHD													
Purge	L												
pH				6.02			6.21			6.1			6.11
Temp	degrees C			19.8			17.1			17.8			19.6
Cond (EC)	uS/cm			1050			1030			1030			1030
Salinity	ppm			530			520			510			520
ROP mv (Field)				310			398			337			361
Alkalinity (Field)				75			87			81			75
TTA				140			135			130			130
Do %S				12.8			12.1			12.9			24.6
Comments													
Al (filtered)	mg/L			0.022			0.020			0.026			0.015
Al(Total)	mg/L						0.030						
As	mg/L						0.0008						
B	mg/L												
Cd	mg/L						<0.0001						
Ca	mg/L												
Cr	mg/L						<0.0001						
Co	mg/L												
Cu	mg/L												
Fe (Filtered)	mg/L			21			23			25			21
Fe (Total)	mg/L						24						
Pb	mg/L												
Mn	mg/L			0.68			0.82			0.82			0.75
Mg	mg/L			18.6						21.7			20.4
Mercury	mg/L												
Molybdenum	mg/L												
Ni	mg/L						0.0032						
Se	mg/L						<0.0002						
U	mg/L												
Zn	mg/L						0.009						
Fl as F													
CaCO3 (Acidity)	mg/L			86			110			100			57
CaCO3 (Alkalinity)	mg/L			51			74			63			36
Bicarbonate				51						63			36
Calcium				4.3						5.4			5.7
Carbonate													
Total Nitrogen							0.063						
Phosphate as PO4-P													
NH3-N	mg/L						<0.010						
Cl	mg/L			274			297			285			270
EC	uS/cm			1010			1110			1060			950
O2	mg/L						3.5						
P	mg/L												
pH Lab				6.3			6.3			6.4			6.2
Potassium				5.7						6.5			6
Sodium				124						141			129
Sulphate	mg/L			23			26			22			23
TDS	mg/L			450			580			530			500
N	mg/L												
Phos	mg/L						0.11						

LOT758_BORE		Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
Date													
Casing Height above topo	m	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Depth of bore	m	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
SWL (m)	m (from top of casing)												
m AHD													
Purge	L												
pH													
Temp	degrees C												
Cond (EC)	uS/cm												
Salinity	ppm												
ROP mv (Field)													
Alkalinity (Field)													
TTA													
Do %S													
Comments				No Testing	No Testing	No Testing	No Testing	No Testing	No Testing	No Testing	No Testing	No Testing	No Testing
Al (filtered)	mg/L												
Al(Total)	mg/L												
As	mg/L												
B	mg/L												
Cd	mg/L												
Ca	mg/L												
Cr	mg/L												
Co	mg/L												
Cu	mg/L												
Fe (Filtered)	mg/L												
Fe (Total)	mg/L												
Pb	mg/L												
Mn	mg/L												
Mg	mg/L												
Mercury	mg/L												
Molybdenum	mg/L												
Ni	mg/L												
Se	mg/L												
U	mg/L												
Zn	mg/L												
Fl as F													
CaCO3 (Acidity)	mg/L												
CaCO3 (Alkalinity)	mg/L												
Bicarbonate													
Calcium													
Carbonate													
Total Nitrogen													
Phosphate as PO4-P													
NH3-N	mg/L												
Cl	mg/L												
EC	uS/cm												
O2	mg/L												
P	mg/L												
pH Lab													
Potassium													
Sodium													
Sulphate	mg/L												
TDS	mg/L												
N	mg/L												
Phos	mg/L												

SWL Triggers
Start increased monitoring
Start mcGibbon track Supplementation

YA_MB 33 GDE A		Mean	1x STDev	2xSTDev	Jun-20	Jul-20	Aug-20	Sep-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21
Date		Jun 20-Oct 21			10/06/2020	9/07/2020	10/08/2020	9/09/2020	24/09/2020	13/10/2020	9/11/2020	8/12/2020	13/01/2021
Casing Height above topo	m				0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
Depth of bore (TOC)	m (from toc)				4.62	4.62	4.62	4.62	4.62	4.62	4.62	4.62	4.62
SWL (m)	m (from toc)	1.32	0.35	0.69	1.52	0.99	0.71	1.04	1.41	1.49	1.22	1.74	1.98
m AHD (ground level)		25.22	0.55	1.09	24.91	25.44	25.72	25.39	25.02	24.94	25.21	24.69	24.45
Purge	L	18.29	7.15	14.30									Bailer x2
pH		5.21	0.10	0.20									5.86
Temp	degrees C	17.99	2.81	5.62									22.9
Cond (EC)	uS/cm	1822	148	296									2070
Salinity	ppm	910	73	147									1030
ROP mv (Field)		361.60	40.18	80.36									397
Alkalinity (Field)		62.23	10.01	20.03									66
TTA		162.68	39.55	79.09									215
Do %S		18.84	7.19	14.39									
Comments		0.00	0.00	0.00	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only
Al (filtered)	mg/L	0.08	0.06	0.12									
Al(Total)	mg/L												
As	mg/L												
B	mg/L												
Cd	mg/L												
Ca	mg/L												
Cr	mg/L												
Co	mg/L												
Cu	mg/L												
Fe (Filtered)	mg/L	17.90	6.84	13.67									
Fe (Total)	mg/L												
Pb	mg/L												
Mn	mg/L	0.68	0.17	0.34									
Mg	mg/L	34.33	3.38	6.76									
Mercury	mg/L												
Molybdenum	mg/L												
Ni	mg/L												
Se	mg/L												
U	mg/L												
Zn	mg/L												
Fl as F													
CaCO3 (Acidity)	mg/L	101.78	18.63	37.26									
CaCO3 (Alkalinity)	mg/L	39.42	10.69	21.39									
Bicarbonate		40.27	9.18	18.36									
Calcium		7.17	1.12	2.23									
Carbonate													
NH3-N	mg/L												
Total Nitrogen													
Cl	mg/L	483.13	44.02	88.04									
EC	uS/cm	1681.05	174.21	348.41									
O2	mg/L												
P	mg/L												
pH Lab		5.20	0.09	0.18									
Potassium		11.09	2.17	4.34									
Sodium		265.31	34.72	69.44									
Sulphate	mg/L	51.95	11.82	23.64									
TDS	mg/L	886.23	69.93	139.86									
N	mg/L												
Phos	mg/L												

YA_MB 33 GDE A	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21
Date	9/02/2021	16/03/2021	15/04/2021	11/05/2021	9/06/2021	8/07/2021	25/08/2021	13/09/2021	13/10/2021	2/11/2021
Casing Height above topo	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
Depth of bore (TOC)	4.62	4.62	4.62	4.62	4.62	4.62	4.62	4.62	4.62	4.62
SWL (m)	1.44	1.82	1.43	1.49	1.35	0.80			1.32	1.45
m AHD (ground level)	24.99	24.61	25.00	24.94	25.08	25.63	26.43	26.43	25.11	24.98
Purge	19	17	14	19	20	23			20	19
pH	5.76	5.71	5.69	5.93	5.92	5.9			5.91	5.99
Temp	22	21.4	20.4	20	17.9	14.5			17.2	17.9
Cond (EC)	2050	2060	1980	2080	2120	1660			2080	2180
Salinity	1020	1030	990	1040	1060	830			1040	1090
ROP mv (Field)	393	403	489	374	379	384			355	387
Alkalinity (Field)	66	75	54	63	84	57			75	81
TTA	130	200	130	190	210	120			190	165
Do %S	14	28.1	23.9	13.8						
Comments							no access	no access		
Al (filtered)	0.13	0.046	0.042	0.017	0.047	0.19			0.051	<0.05
Al(Total)										
As										
B										
Cd										
Ca										
Cr										
Co										
Cu										
Fe (Filtered)	15	22	9.6	24	25	9.9			24	24
Fe (Total)										
Pb										
Mn	0.74	0.85	0.68	0.81	0.83	0.37			0.82	0.77
Mg	41.7	44.2	42.6	36.4						
Mercury										
Molybdenum										
Ni										
Se										
U										
Zn										
Fl as F										
CaCO3 (Acidity)	110	120	100	130	110	77			130	140
CaCO3 (Alkalinity)	42	59	38	44	32	28			51	64
Bicarbonate	42	59	38	44						
Calcium	7.6	8.6	9.9	7.5						
Carbonate										
NH3-N										
Total Nitrogen										
Cl	564	548	538	550	564	443			570	531
EC	1940	2020	1880	1890	1940	1490			1940	1970
O2										
P										
pH Lab	6	5.9	5.8	5.9	5.8	6			6	6.1
Potassium	12.9	12.5	15.5	10.2						
Sodium	299	310	312	288	306	218			320	285
Sulphate	66	58	62	59	58	30			59	58
TDS	1000	1000	1100	990	1000	860			1000	990
N										
Phos										

YA_MB 33 GDE A	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
Date	13/12/2021	7/01/2022	7/02/2022	8/03/2022	14/04/2022	26/05/2022	4/07/2022	5/08/2022	29/08/2022	26/09/2022	4/11/2022	2/12/2022	21/12/2022
Casing Height above topo	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
Depth of bore (TOC)	4.62	4.62	4.62	4.62	4.62	4.62	4.62	4.62	4.62	4.62	4.62	4.62	4.62
SWL (m)	1.83	1.95	2.06	2.14	2.06	1.5	1.51	0.88	1.33	1.42	1.68	1.85	1.99
m AHD (ground level)	24.60	24.48	24.37	24.29	24.37	24.93	24.92	25.55	25.10	25.01	24.75	24.58	24.44
Purge													
pH													
Temp													
Cond (EC)													
Salinity													
ROP mv (Field)													
Alkalinity (Field)													
TTA													
Do %S													
Comments	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only
Al (filtered)													
Al(Total)													
As													
B													
Cd													
Ca													
Cr													
Co													
Cu													
Fe (Filtered)													
Fe (Total)													
Pb													
Mn													
Mg													
Mercury													
Molybdenum													
Ni													
Se													
U													
Zn													
Fl as F													
CaCO3 (Acidity)													
CaCO3 (Alkalinity)													
Bicarbonate													
Calcium													
Carbonate													
NH3-N													
Total Nitrogen													
Cl													
EC													
O2													
P													
pH Lab													
Potassium													
Sodium													
Sulphate													
TDS													
N													
Phos													

SWL Triggers: Start increased monitoring; Start mcGibbon track Supplementation

YA_MB 34 GDE B		Mean	1x STDev	2xSTDev	Jun-20	Jul-20	Aug-20	Sep-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21
Date			Jun 20-Oct 21		10/06/2020	9/07/2020	10/08/2020	9/09/2020	24/09/2020	13/10/2020	9/11/2020	8/12/2020	13/01/2021	9/02/2021	16/03/2021	15/04/2021	11/05/2021	9/06/2021	8/07/2021
Casing Height above topo	m				0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61
Depth of bore	m				6.87	6.87	6.87	6.87	6.87	6.87	6.87	6.87	6.87	6.87	6.87	6.87	6.87	6.87	6.87
SWL (m)	m (from top of casing)	2.53	0.55	1.11	3.2	2.63	1.88	1.66	1.97	2.16	2.54	2.68	2.98	3.08	3.18	3.17	3.02	2.61	2.02
m AHD (ground level)		20.87	0.55	1.11	20.20	20.77	21.52	21.74	21.43	21.24	20.86	20.72	20.42	20.32	20.22	20.23	20.38	20.79	21.38
Purge	L	25.14	9.50	19.00									Bail x2	23	22	22	23	26	29
pH		5.81	0.29	0.59									6.32	5.87	5.64	5.56	5.61	5.78	5.52
Temp	degrees C	17.51	1.30	2.60									19.5	18.7	18.4	16.7	18	16	16.3
Cond (EC)	uS/cm	4224	2397	4794									9800	3600	3260	2920	2920	2990	2950
Salinity	ppm	2111	1199	2399									4900	1800	1620	1460	1460	1490	1480
ROP mv (Field)		406.63	43.71	87.42									431	400	409	501	378	377	395
Alkalinity (Field)		64.50	37.71	75.42									141	54	18	48	63	51	45
TTA		123.88	35.98	71.96									200	100	100	136	140	125	90
Do %S		25.68	7.87	15.73										30.9	33.5	21.6	16.7		
Comments					Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only						
Al (filtered)	mg/L	0.05	0.07	0.15										0.02	0.029	0.014	<0.005	0.012	0.01
Al(Total)	mg/L																		
As	mg/L																		
B	mg/L																		
Cd	mg/L																		
Ca	mg/L																		
Cr	mg/L																		
Co	mg/L																		
Cu	mg/L																		
Fe (Filtered)	mg/L	4.36	1.73	3.47										2.5	6.4	7	3.3	4.6	3
Fe (Total)	mg/L																		
Pb	mg/L																		
Mn	mg/L	1.36	0.36	0.72										1.2	1.7	2	1.1	1.2	1
Mg	mg/L	93.53	11.60	23.19										92.4	104	100	77.7		
Mercury	mg/L																		
Molybdenum	mg/L																		
Ni	mg/L																		
Se	mg/L																		
U	mg/L																		
Zn	mg/L																		
Fl as F																			
CaCO3 (Acidity)	mg/L	71.86	10.90	21.80										63	61	62	77	83	88
CaCO3 (Alkalinity)	mg/L	48.14	36.81	73.62										48	39	33	32	29	26
Bicarbonate		38.00	7.35	14.70										48	39	33	32		
Calcium		32.33	11.61	23.23										28.1	37.3	45.4	18.5		
Carbonate																			
NH3-N	mg/L																		
Total Nitrogen																			
Cl	mg/L	1083.14	482.33	964.67										1080	931	861	831	851	868
EC	uS/cm	3550.00	1518.39	3036.77										3440	3150	2870	2730	2850	2860
O2	mg/L																		
P	mg/L																		
pH Lab		6.07	0.21	0.43										6.2	6	6	5.9	6	5.9
Potassium		44.98	16.85	33.69										43.6	52.2	61.8	22.3		
Sodium		605.43	215.98	431.95										517	676	776	414	447	424
Sulphate	mg/L	139.29	76.18	152.36										130	120	95	110	110	100
TDS	mg/L	1885.71	726.70	1453.40										1800	1600	1800	1400	1500	1600
N	mg/L																		
Phos	mg/L																		

YA_MB 34 GDE B	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
Date	25/08/2021	13/09/2021	13/10/2021	4/11/2021	13/12/2021	7/01/2022	7/02/2022	8/03/2022	14/04/2022	26/05/2022	4/07/2022	5/08/2022	29/08/2022	26/09/2022	4/11/2022	2/12/2022	21/12/2022
Casing Height above topo	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61
Depth of bore	6.87	6.87	6.87	6.87	6.87	6.87	6.87	6.87	6.87	6.87	6.87	6.87	6.87	6.87	6.87	6.87	6.87
SWL (m)			1.72	1.96	2.67	2.89	3.13	3.33	3.64	3.61	2.98	2.04	1.63	1.82	2.54	2.87	3.09
m AHD (ground level)			21.68	21.44	20.73	20.51	20.27	20.07	19.76	19.79	20.42	21.36	21.77	21.58	20.86	20.53	20.31
Purge			31	29													
pH			6.16	6.64													
Temp			16.5	17.2													
Cond (EC)			5350	12630													
Salinity			2680	6320													
ROP mv (Field)			362	451													
Alkalinity (Field)			96	147													
TTA			100	100													
Do %S																	
Comments	no access	no access			Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only
Al (filtered)			0.21	0.78													
Al(Total)																	
As																	
B																	
Cd																	
Ca																	
Cr																	
Co																	
Cu																	
Fe (Filtered)			3.7	1.5													
Fe (Total)																	
Pb																	
Mn			1.3	0.77													
Mg																	
Mercury																	
Molybdenum																	
Ni																	
Se																	
U																	
Zn																	
Fl as F																	
CaCO3 (Acidity)			69	62													
CaCO3 (Alkalinity)			130	190													
Bicarbonate																	
Calcium																	
Carbonate																	
NH3-N																	
Total Nitrogen																	
Cl			2160	4000													
EC			6950	12900													
O2																	
P																	
pH Lab			6.5	7													
Potassium																	
Sodium			984	2240													
Sulphate			310	580													
TDS			3500	7100													
N																	
Phos																	

SWL Triggers
Start increased monitoring
Start mcGibbon track Supplementation

YA_MB 35 GDE C		Mean	1x STDev	2xSTDev	Jun-20	Jul-20	Aug-20	Sep-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21
Date		Jun 20-Oct 21			10/06/2020	9/07/2020	10/08/2020	9/09/2020	24/09/2020	13/10/2020	9/11/2020	8/12/2020	13/01/2021	9/02/2021	16/03/2021	15/04/2021	11/05/2021	9/06/2021	8/07/2021	25/08/2021	13/09/2021	14/10/2021	2/11/2021
Casing Height above topo	m				0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56
Depth of bore	m				6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56
SWL (m)	m (from top of casing)	1.36	0.48	0.96	1.78	1.13	0.63	0.64	1.11	1.31	1.54	1.74	1.96	1.99	1.97	1.76	1.61	1.26	0.67			0.99	1
m AHD (ground level)		21.97	0.48	0.96	21.57	22.22	22.72	22.71	22.24	22.04	21.81	21.61	21.39	21.36	21.38	21.59	21.74	22.09	22.68			22.36	22.35
Purge	L	29.53	11.13	22.26									Bailer x2	27	28	29	30	32	35			33	33
pH		5.93	0.35	0.70									6.37	6.41	6.1	6.34	6.96	6.88	7.09			6.5	6.58
Temp	degrees C	16.57	2.41	4.82									21.2	17.9	21.4	19.1	17.8	16.3	15.1			15.5	17.3
Cond (EC)	uS/cm	3009	1990	3979									2320	2040	2060	2990	5460	6330	930			970	1060
Salinity	ppm	1503	995	1990									1160	1020	1030	1500	2730	3160	460			480	530
ROP mv (Field)		363.81	36.14	72.28									401	396	379	481	395	410	380			360	365
Alkalinity (Field)		159.44	82.96	165.92									81	90	87	120	300	246	210			135	180
TTA		85.04	23.18	46.36									85	65	95	109	105	90	50			120	95
Do %S		24.49	7.57	15.13										28.5	28.8	33.9	16.1						
Comments		0.00	0.00	0.00	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only							no access	no access		
Al (filtered)	mg/L	0.05	0.03	0.06										0.054	0.024	0.067	0.017	0.02	0.1			0.036	0.057
Al(Total)	mg/L																						
As	mg/L																						
B	mg/L																						
Cd	mg/L																						
Ca	mg/L																						
Cr	mg/L																						
Co	mg/L																						
Cu	mg/L																						
Fe (Filtered)	mg/L	1.58	1.38	2.76										0.37	0.59	2.6	0.82	1.2	0.32			4	3.3
Fe (Total)	mg/L																						
Pb	mg/L																						
Mn	mg/L	0.06	0.03	0.07										0.032	0.034	0.13	0.070	0.051	0.044			0.07	0.1
Mg	mg/L	68.71	44.94	89.87										29.7	28.9	71.1	124						
Mercury	mg/L																						
Molybdenum	mg/L																						
Ni	mg/L																						
Se	mg/L																						
U	mg/L																						
Zn	mg/L																						
Fl as F																							
CaCO3 (Acidity)	mg/L	36.25	12.98	25.97										36	45	45	30	29	20			59	57
CaCO3 (Alkalinity)	mg/L	168.10	70.88	141.76										100	83	130	270	220	230			170	230
Bicarbonate		150.63	85.08	170.16										100	83	130	270						
Calcium		33.00	22.35	44.70										14.8	12.9	31.4	61.2						
Carbonate																							
NH3-N	mg/L																						
Total Nitrogen																							
Cl	mg/L	808.04	618.65	1237.30										514	507	750	1430	1740	109			177	165
EC	uS/cm	3039.52	2116.59	4233.18										1960	2000	2880	5250	6270	829			894	936
O2	mg/L																						
P	mg/L																						
pH Lab		6.13	0.39	0.77										6.7	6.4	6.7	7	7.3	7.5			6.7	6.8
Potassium		3.76	1.24	2.48										3.3	3.3	3.8	5.9						
Sodium		560.93	401.23	802.45										329	342	675	957	1130	141			111	113
Sulphate	mg/L	221.44	190.28	380.56										100	110	190	450	480	49			12	14
TDS	mg/L	1748.62	1294.49	2588.99										1100	1000	1600	3000	3800	500			400	440
N	mg/L																						
Phos	mg/L																						

YA_MB 35 GDE C	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
Date	13/12/2021	7/01/2022	7/02/2022	8/03/2022	14/04/2022	26/05/2022	20/06/2022	5/08/2022	29/08/2022	26/09/2022	4/11/2022	2/12/2022	20/12/2022
Casing Height above topo	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56
Depth of bore	6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56	6.56
SWL (m)	1.83	1.96	2.15	4.7	4.54	2.07	1.76	0.73	0.93	0.92	1.29	1.64	1.89
m AHD (ground level)	21.52	21.39	21.20	18.65	18.81	21.28	21.59	22.62	22.42	22.43	22.06	21.71	21.46
Purge													
pH													
Temp													
Cond (EC)													
Salinity													
ROP mv (Field)													
Alkalinity (Field)													
TTA													
Do %S													
Comments	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only
Al (filtered)													
Al(Total)													
As													
B													
Cd													
Ca													
Cr													
Co													
Cu													
Fe (Filtered)													
Fe (Total)													
Pb													
Mn													
Mg													
Mercury													
Molybdenum													
Ni													
Se													
U													
Zn													
Fl as F													
CaCO3 (Acidity)													
CaCO3 (Alkalinity)													
Bicarbonate													
Calcium													
Carbonate													
NH3-N													
Total Nitrogen													
Cl													
EC													
O2													
P													
pH Lab													
Potassium													
Sodium													
Sulphate													
TDS													
N													
Phos													

SWL Triggers: Start increased monitoring
Start mcGibbon track Supplementation

YA_MB 36 GDE D		Mean	1x STDev	2xSTDev	Jun-20	Jul-20	Aug-20	Sep-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21
Date		Jun 20-Oct 21			10/06/2020	8/07/2020	6/08/2020	7/09/2020	24/09/2020	12/10/2020	5/11/2020	7/12/2020	12/01/2021
Casing Height above topo	m				0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61
Depth of bore	m				6.02	6.02	6.02	6.02	6.02	6.02	6.02	6.02	6.02
SWL (m)	m (from top of casing)	1.54	0.47	0.94	1.95	1.4	1.09	0.62	1.21	1.33	1.62	1.73	2.08
m AHD (ground level)		21.83	0.47	0.94	21.45	22.00	22.31	22.78	22.19	22.07	21.78	21.67	21.32
Purge	L	24.73	9.43	18.85									Bail/Purge 23
pH		5.80	2.15	4.30									6.20/6.23
Temp	degrees C	17.66	6.74	13.48									23.2/23.3
Cond (EC)	uS/cm	8281	4208	8416									3870/4900
Salinity	ppm	4139	2104	4209									1940/2450
ROP mv (Field)		402.56	153.73	307.46									383/370
Alkalinity (Field)		89.51	47.53	95.05									81/87
TTA		113.88	49.53	99.06									100/105
Do %S		23.83	7.72	15.44									
Comments		0.00	0.00	0.00	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only
Al (filtered)	mg/L	0.03	0.01	0.03									
Al(Total)	mg/L												
As	mg/L												
B	mg/L												
Cd	mg/L												
Ca	mg/L												
Cr	mg/L												
Co	mg/L												
Cu	mg/L												
Fe (Filtered)	mg/L	9.01	3.42	6.84									
Fe (Total)	mg/L												
Pb	mg/L												
Mn	mg/L	0.05	0.02	0.04									
Mg	mg/L	221.55	118.37	236.74									
Mercury	mg/L												
Molybdenum	mg/L												
Ni	mg/L												
Se	mg/L												
U	mg/L												
Zn	mg/L												
Fl as F													
CaCO3 (Acidity)	mg/L	57.86	7.93	15.85									
CaCO3 (Alkalinity)	mg/L	81.67	39.67	79.34									
Bicarbonate		52.21	23.53	47.06									
Calcium		37.47	20.92	41.84									
Carbonate													
NH3-N	mg/L												
Total Nitrogen													
Cl	mg/L	2612.14	1113.55	2227.10									
EC	uS/cm	8232.05	3413.21	6826.43									
O2	mg/L												
P	mg/L												
pH Lab		5.61	0.28	0.56									
Potassium		6.82	2.26	4.51									
Sodium		1438.75	644.01	1288.01									
Sulphate	mg/L	368.94	155.75	311.49									
TDS	mg/L	4562.05	1998.21	3996.43									
N	mg/L												
Phos	mg/L												

YA_MB 36 GDE D	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21
Date	9/02/2021	16/03/2021	15/04/2021	11/05/2021	9/06/2021	8/07/2021	25/08/2021	13/09/2021	13/10/2021	2/11/2021
Casing Height above topo	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61
Depth of bore	6.02	6.02	6.02	6.02	6.02	6.02	6.02	6.02	6.02	6.02
SWL (m)	2.14	2.25	1.98	1.94	1.61	1.08			1.13	1.18
m AHD (ground level)	21.26	21.15	21.42	21.46	21.79	22.32			22.27	22.22
Purge	23	23	24	24	26	30			29	29
pH	5.88	5.62	5.58	6.02	6.2	6.36			6.45	6.45
Temp	21	20.2	18.7	19.4	16.7	15.8			16	16.2
Cond (EC)	3890	3810	7760	10720	11860	10500			9290	10330
Salinity	1940	1910	3860	5360	5930	5260			4640	5160
ROP mv (Field)	374	402	516	376	417	427			401	438
Alkalinity (Field)	54	45	66	72	120	144			120	135
TTA	70	114	138	140	145	125			80	90
Do %S	29.3	29.2	30.8	14.4						
Comments							no access	no access		
Al (filtered)	0.056	0.020	0.017	0.015	0.032	0.019			0.02	0.031
Al(Total)										
As										
B										
Cd										
Ca										
Cr										
Co										
Cu										
Fe (Filtered)	5.8	6.1	6.3	11	15	10			11	13
Fe (Total)										
Pb										
Mn	0.074	0.062	0.063	0.058	0.034	0.019			0.029	0.055
Mg	118	114	302	337						
Mercury										
Molybdenum										
Ni										
Se										
U										
Zn										
Fl as F										
CaCO3 (Acidity)	54	65	67	73	72	63			53	63
CaCO3 (Alkalinity)	46	35	45	88	110	120			130	130
Bicarbonate	46	35	45	88						
Calcium	19.5	17.2	52.1	56.7						
Carbonate										
NH3-N										
Total Nitrogen										
Cl	1170	1150	2460	3440	3870	3420			3160	3030
EC	3760	3860	7820	10800	12100	10800			9890	10500
O2										
P										
pH Lab	6.2	5.9	6.1	6.3	6.6	6.6			6.6	6.5
Potassium	5.4	5.5	9.2	9.5						
Sodium	573	559	1530	1920	2190	1730			1720	1810
Sulphate	170	170	340	500	550	480			430	480
TDS	2000	1900	4800	5600	6800	6600			4800	6100
N										
Phos										

YA_MB 36 GDE D	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
Date	13/12/2021	7/01/2022	7/02/2022	8/03/2022	14/04/2022	26/05/2022	28/6/822	5/08/2022	29/08/2022	26/09/2022	4/11/2022	2/12/2022	21/12/2022
Casing Height above topo	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61
Depth of bore	6.02	6.02	6.02	6.02	6.02	6.02	6.02	6.02	6.02	6.02	6.02	6.02	6.02
SWL (m)	1.8	1.85	2.17	2.33	2.44	2.26	1.7	0.81	0.93	1.1	1.59	1.85	2
m AHD (ground level)	21.60	21.55	21.23	21.07	20.96	21.14	21.70	22.59	22.47	22.30	21.81	21.55	21.40
Purge													
pH													
Temp													
Cond (EC)													
Salinity													
ROP mv (Field)													
Alkalinity (Field)													
TTA													
Do %S													
Comments	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only
Al (filtered)													
Al(Total)													
As													
B													
Cd													
Ca													
Cr													
Co													
Cu													
Fe (Filtered)													
Fe (Total)													
Pb													
Mn													
Mg													
Mercury													
Molybdenum													
Ni													
Se													
U													
Zn													
Fl as F													
CaCO3 (Acidity)													
CaCO3 (Alkalinity)													
Bicarbonate													
Calcium													
Carbonate													
NH3-N													
Total Nitrogen													
Cl													
EC													
O2													
P													
pH Lab													
Potassium													
Sodium													
Sulphate													
TDS													
N													
Phos													

SWL Triggers: Start increased monitoring; Start mcGibbon track Supplementation

YA_MB 37 GDE E		Mean	1x STDev	2xSTDev	Jun-20	Jul-20	Aug-20	Sep-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21
Date		Jun 20-Oct 21			10/06/2020	8/07/2020	10/08/2020	9/09/2020	24/09/2020	13/10/2020	9/11/2020	8/12/2020	13/01/2021
Casing Height above topo	m				0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54
Depth of bore	m				5.46	5.46	5.46	5.46	5.46	5.46	5.46	5.46	5.46
SWL (m)	m (from top of casing)	0.97	0.34	0.68	1.09	0.64	0.46	0.44	0.88	0.98	1.08	1.32	1.53
m AHD (ground level)		22.34	0.34	0.68	22.24	22.69	22.87	22.89	22.45	22.35	22.25	22.01	21.80
Purge	L	25.50	9.51	19.02									Bailer x2
pH		5.13	0.15	0.29									5.56
Temp	degrees C	17.03	2.22	4.44									23
Cond (EC)	uS/cm	1006	35	71									1150
Salinity	ppm	505	13	26									570
ROP mv (Field)		338.72	43.74	87.48									365
Alkalinity (Field)		43.27	30.72	61.45									30
TTA		65.68	11.56	23.13									80
Do %S		23.10	7.40	14.80									
Comments		0.00	0.00	0.00	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only
Al (filtered)	mg/L	0.14	0.19	0.37									
Al(Total)	mg/L												
As	mg/L												
B	mg/L												
Cd	mg/L												
Ca	mg/L												
Cr	mg/L												
Co	mg/L												
Cu	mg/L												
Fe (Filtered)	mg/L	1.38	0.16	0.32									
Fe (Total)	mg/L												
Pb	mg/L												
Mn	mg/L	0.02	0.01	0.01									
Mg	mg/L	17.98	0.36	0.71									
Mercury	mg/L												
Molybdenum	mg/L												
Ni	mg/L												
Se	mg/L												
U	mg/L												
Zn	mg/L												
Fl as F													
CaCO3 (Acidity)	mg/L	39.91	5.66	11.31									
CaCO3 (Alkalinity)	mg/L	21.29	4.14	8.28									
Bicarbonate		18.25	1.63	3.27									
Calcium		3.95	0.57	1.14									
Carbonate													
NH3-N	mg/L												
Total Nitrogen													
Cl	mg/L	238.71	6.32	12.65									
EC	uS/cm	927.43	41.20	82.40									
O2	mg/L												
P	mg/L												
pH Lab		5.30	0.11	0.22									
Potassium		2.67	0.08	0.16									
Sodium		139.25	4.49	8.98									
Sulphate	mg/L	51.82	1.80	3.60									
TDS	mg/L	488.47	28.87	57.74									
N	mg/L												
Phos	mg/L												

YA_MB 37 GDE E	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
Date	9/02/2021	17/03/2021	15/04/2021	11/05/2021	9/06/2021	8/07/2021	25/08/2021	13/09/2021	13/10/2021	2/11/2021	13/12/2021
Casing Height above topo	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54
Depth of bore	5.46	5.46	5.46	5.46	5.46	5.46	5.46	5.46	5.46	5.46	5.46
SWL (m)	1.33	1.4	1.2	1.12	0.89	0.53			0.91	0.98	1.45
m AHD (ground level)	22.00	21.93	22.13	22.21	22.44	22.80			22.42	22.35	21.88
Purge	25	24	26	26	27	30			27	27	
pH	5.68	5.52	5.73	5.88	5.94	5.82			5.73	5.81	
Temp	19.9	16.7	19.1	19.4	16.8	16.6			17.3	16.6	
Cond (EC)	1060	1080	1140	1140	1150	1150			1110	1170	
Salinity	580	540	570	570	570	570			550	580	
ROP mv (Field)	353	387	458	314	332	362			390	413	
Alkalinity (Field)	30	24	30	33	115	45			21	27	
TTA	52	74	72	70	90	70			60	58	
Do %S	31.6	25.6	28.8	14.7							
Comments							no access	no access			Dip Only
Al (filtered)	0.054	0.52	0.009	0.005	0.021	0.018			0.085	0.68	
Al(Total)											
As											
B											
Cd											
Ca											
Cr											
Co											
Cu											
Fe (Filtered)	1.6	1.8	1.3	1.4	1.5	1.6			1.5	1.5	
Fe (Total)											
Pb											
Mn	0.035	0.024	0.029	0.023	0.020	0.020			0.02	0.021	
Mg	22.1	22.3	22.8	22							
Mercury											
Molybdenum											
Ni											
Se											
U											
Zn											
Fl as F											
CaCO3 (Acidity)	44	55	43	36	45	43			42	37	
CaCO3 (Alkalinity)	24	22	22	20	22	20			32	23	
Bicarbonate	24	22	22	20							
Calcium	4.3	4.4	5.5	4.4							
Carbonate											
NH3-N											
Total Nitrogen											
Cl	270	266	284	266	267	271			273	257	
EC	1080	1050	1070	997	1010	1020			1110	1030	
O2											
P											
pH Lab	6.1	5.8	6	6	6.1	6.1			6.1	6	
Potassium	3.2	3.3	3.3	3.4							
Sodium	151	157	165	159	159	154			160	152	
Sulphate	59	58	62	58	59	56			59	60	
TDS	540	520	610	530	550	550			550	490	
N											
Phos											

YA_MB 37 GDE E	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
Date	7/01/2022	7/02/2022	8/03/2022	14/04/2022	26/05/2022	20/06/2022	5/08/2022	29/08/2022	26/09/2022	4/11/2022	2/12/2022	21/12/2022
Casing Height above topo	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54
Depth of bore	5.46	5.46	5.46	5.46	5.46	5.46	5.46	5.46	5.46	5.46	5.46	5.46
SWL (m)	1.5	**2.15**	**2.37**	**2.08**	1.69	1.32	0.67	1.05	1.13	1.51	1.74	1.86
m AHD (ground level)	21.83	21.18	20.96	21.25	21.64	22.01	22.66	22.28	22.20	21.82	21.59	21.47
Purge												
pH												
Temp												
Cond (EC)												
Salinity												
ROP mv (Field)												
Alkalinity (Field)												
TTA												
Do %S												
Comments	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only	Dip Only
Al (filtered)												
Al(Total)												
As												
B												
Cd												
Ca												
Cr												
Co												
Cu												
Fe (Filtered)												
Fe (Total)												
Pb												
Mn												
Mg												
Mercury												
Molybdenum												
Ni												
Se												
U												
Zn												
Fl as F												
CaCO3 (Acidity)												
CaCO3 (Alkalinity)												
Bicarbonate												
Calcium												
Carbonate												
NH3-N												
Total Nitrogen												
Cl												
EC												
O2												
P												
pH Lab												
Potassium												
Sodium												
Sulphate												
TDS												
N												
Phos												

APPENDIX E
PIT DEWATERING WATER QUALITY DATA

MINE BLOCK 91

Date	Field pH	EC @ 25 °	TDS	temp	Alkalinity	ROP	TTA	TSS	Liming
28/02/2022	6.6	2540		27.4	75		32		
1/03/2022	6.16	2390		19.2	40	NA	55		
2/03/2022	6.59	2720		19.4	48	312	45		
3/03/2022	6.32	2840		18	45	185	55		
4/03/2022	6.5	2780		19.8	60	170	38		
5/03/2022	6.45	2750		23.1	56	200	55		
6/03/2022	6.26	3560		22.9	54	347	55		
7/03/2022	5.89	2590		24.4	38	347	85		
8/03/2022	6.48	2730		20.1	33	292	45		
9/03/2022	6.64	3330		20.1	71	376	40		
10/03/2022	6.36	3460		21.6	60	380			
11/03/2022	6.18	2720		19.5	63	326	45		
12/03/2022	6.65	4120		18.3	63	333	30		
13/03/2022	6.62	3240		19.3	48	323	31		
14/03/2022	7.3	2980		27	96	309	30		
15/03/2022	7.06	3340		25.5	96	304	40		
16/03/2022	6.57	3200		21.9	51	441	34		
17/03/2022	6.23	2610		22	45	435	40		
18/03/2022	6.54	2660		24.7	51		23		
19/03/2022	6.73	3140		16.9	57	415	22		
20/03/2022	6.6	3130		24.9	57	406	20		
21/03/2022	6.65	2790		23.2	45	399	18		
22/03/2022	6.52	3040		17.2	35	403	45		
23/03/2022	6.42	2420		18.3	30	400	45		
24/03/2022	6.36	2470		19.7	54	390	35		
28/03/2022	6.49	2600		16.9	54	362	27		
4/04/2022	6.9	2910		19.1	42	337	9		
12/04/2022	6.83	1470		21.2	44	395	30		
13/04/2022	7.2	1600		21.7	45		33		
14/04/2022	7.61	1660		18.5	36		15		
15/04/2022	7.19	1570		17.4	30	328	8		
16/04/2022	7.57	1870		17	42	329	8		
17/04/2022	7.57	2420		14.2	48		11		
18/04/2022	7.53	1610		12.8	45		8		
19/04/2022	7.36	2010		20.1	45		10		
20/04/2022	6.88	1880		17	48	355	45		
21/04/2022	6.9	1450		19.5	45	378	18		
22/04/2022	7.06	1870		9.9	51	336	30		
23/04/2022	7.12	1830		10.2	48		9		
24/04/2022	7.08	1900		10.5	39		10		
25/04/2022	7.13	1830		11.4	42		10		
26/04/2022	7.27	1810		17.6	45	341	21		
27/04/2022	7.55	1860		18.9	45	356	9		
28/04/2022	7.37	1900		20.2	48		13		
29/04/2022	7.73	1510		18.6	60	290	6		
30/04/2022	7.3	1970		14	57		11		
1/05/2022	7.82	2010		14.4	66		12		
2/05/2022	7.5	2050		19.2	69		12		
3/05/2022	7.44	2010		17	66	303	13		
4/05/2022	7.7	1680		15.9	78	338	11		
5/05/2022	7.6	2160		17	75	345	13		
6/05/2022									
7/05/2022									
8/05/2022	7.73	2050		20	99		13		
9/05/2022	7.73	2120		19.1	90		11		
10/05/2022	7.01	2320		18.3	90		30		
11/05/2022	7.4	2290		18.1	60	342	30		
12/05/2022	7.4	2350		15.4	105	347	38		
13/05/2022	7.59	2350		15.4	90	369	10		
14/05/2022	7.79	1890		14.9	96		10		
15/05/2022	7.83	1950		15.5	105		12		
16/05/2022	7.67	1990		18.1	96		20		
17/05/2022	7.35	2220		17.1	80		40		
18/05/2022	7.35	2500		17.2	90	328	50		
19/05/2022	7.26	2570		16.8	105	396	40		
20/05/2022	7.39	2610		17	135	417	30		
21/05/2022	7.7	2730		9.1	108	335	22		
22/05/2022	7.69	2560		9.5	110	340	20		
23/05/2022	7.56	2710		15.3	135	346	30		
24/05/2022	7.48	2500		18	105	284	30		
25/05/2022	7.2	2060		17	120	343	22		
26/05/2022	7.25	2750		14	90	264	26		
27/05/2022									
28/05/2022	7.29	2880		6	96	277	24		
29/05/2022	7.60	2890		6.2	105	276	20		
30/05/2022	7.15	2870		12.1	84	273	16		
31/05/2022	7.26	2780		15.6	105	292	39		
1/06/2022	7.22	2570		16.7	105	374	35		
2/06/2022	7.31	2530		17.2	75	384	28		
3/06/2022	7.47	2470		15.9	90	359	24		
4/06/2022	8.04	2590		16.9	90		8		
5/06/2022	7.94	2550		16.3	72		9		
6/06/2022	7.84	2590		16.6	75		12		
7/06/2022	8.3	2670		15.5	108		13		
8/06/2022	8.18	2730		13	105		10		
9/06/2022	8.6	2710		13.2	135	327	9		
10/06/2022	8.6	2600		15	123	343	10		
11/06/2022									
12/06/2022	8.16	2650		16.1	72	331	13		
13/06/2022	8.21	2610		15.4	72	325	14		
14/06/2022	7.83	2510		15.8	105	308	20		
15/06/2022	7.82	2500		16	105	334	25		
16/06/2022	7.47	2520		18.8	105	322	20		
17/06/2022	8.26	2620		17.6	81		14		
18/06/2022	8.4	2650		15.2	75		14		
19/06/2022	8.47	2640		15.4	90		14		
20/06/2022	8.42	2600		16.2	90		10		
21/06/2022	8.16	2550		16.1	90	307	18		
22/06/2022	8.22	2570		18.9	80	364	20		
23/06/2022	8.11	2610		16.4	140	340	25		
24/06/2022	8.6	2600		9.5	117	356	11		
25/06/2022	8.64	2570		11.1	120		15		
26/06/2022	8.71	2630		9.7	120		13		
27/06/2022	8.5	2580		16.5	120	364	15		
28/06/2022	8.1	2770		15	135		11		
29/06/2022	8.09	2780		13.1	114	339	15		
30/06/2022	7.99	2710		15.4	135	324	18		
1/07/2022	8.05	2900		13.6	120	333	20		
2/07/2022	8.2	2900		16.6	135		10		
3/07/2022	8.34	2910		16.9	120		14		
4/07/2022	8.14	2980		11.5	135	341	23		
5/07/2022	8.2	2890		15	135	321	25		
6/07/2022	8.15	2890		11.4	135	345	30		
7/07/2022	8.15	2920		12.5	132	417	36		
8/07/2022	8.1	2810		12.5	120	400	28		
9/07/2022	8.47	2920		12.7	120		16		
10/07/2022	8.53	2710		12.9	123		15		
11/07/2022	8.6	2700		13.8	120		15		
12/07/2022	8.46	2650		12.1	135	366	28		
13/07/2022	8.24	2660		16.7	147	349	40		
14/07/2022	8.55	2600		9	105		13		
15/07/2022	8.36	2250		15.7	135		20		
16/07/2022	8.21	2220		11.9	128	303	20		
17/07/2022	8.57	2390		10.1	120	200	10		
18/07/2022	8.47	2280		15.1	111		14		
19/07/2022	8.48	2380		11.1	126	374	28		
20/07/2022	8.31	2260		11.9	120	362	22		
21/07/2022	8.41	1770		15.1	96	360	30		
22/07/2022	8.44	1660		17.2	111		12		
23/07/2022	8.9	2160		6.2	108		18		
24/07/2022	8.9	2160		6.1	90		20		
25/07/2022	8.16	1440		15.7	75		10		
26/07/2022	8.57	1690		8.7	114	341	24		
27/07/2022	8.44	1920		12.5	114	328	24		
28/07/2022	8.26	1810		15.2	105	333	20		
29/07/2022									
30/07/2022	8.37	1790		12.5	120	337	24		
31/07/2022	8.55	1860		14.5	105	352	26		
1/08/2022	8.23	1810		14.6	72	343	22		
2/08/2022									
3/08/2022									
4/08/2022									
5/08/2022									
6/08/2022									
7/08/2022									
8/08/2022									
9/08/2022	8.08	1480		15.4	96	335	24		
10/08/2022									
11/08/2022									
12/08/2022									
13/08/2022									
14/08/2022									
15/08/2022									
16/08/2022	7.95	1480		14	75	349	34		
17/08/2022									
18/08/2022									
19/08/2022									
20/08/2022									
21/08/2022									
22/08/2022									
23/08/2022									
24/08/2022	8.34	1500		14.8	120	287	18		
25/08/2022									
26/08/2022									
27/08/2022									
28/08/2022									
29/08/2022									
30/08/2022	8.3	1530		18.3	114	333	12		
31/08/2022									
1/09/2022									
2/09/2022	8.27	1570		21	84	336	20		
3/09/2022									
4/09/2022									
5/09/2022									
6/09/2022									
7/09/2022	8.33	1540		14.8	120	365	20		
8/09/2022									
9/09/2022									
10/09/2022									
11/09/2022									
12/09/2022									
13/09/2022									
14/09/2022									
15/09/2022	8.43	1500		16.7	120	271	20		
16/09/2022									
17/09/2022									
18/09/2022									
19/09/2022									
20/09/2022									
21/09/2022	8.5	1520		18.6	150	332	20		
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14/10/2022	8.29	2150		18.1	108	260	20		
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3/11/2022	8.2	2600	1200	25	120	250	40		
4/11/2022									
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31/12/2022									

Date	Al (Filtered)	As	Cd	Cr	Cu	Fe (Filtered)	Pb	Mg	Mn (Filtered)	Mercury	Ni	Se	Zn	Acidity as CaCO3	Alkalinity as CaCO3	Cl	Ec	Lab pH	SO4 (Sulphate)	TDS	So4:cCl ratio
1/03/2022	0.011					0.7			0.035					28	45	641	2290	6.6	95	1100	0.148205928
20/04/2022	0.12					0.072			0.21					6	51	514	2070	7.2	150	1100	0.291828794
10/05/2022	0.068					0.038			0.009					4	93	431	2030	7.9	250	1000	0.580046404
6/07/2022	0.024					0.013			0.023					<2	160	506	2610	8.3	440	1400	0.869565217
27/07/2022	0.13					0.062			0.017					<2	130	299	1660	8.3	260	890	0.869565217

MINE BLOCK 69

Date	Field pH	EC @ 25 °	TDS	temp	Alkalinity	ROP	TTA	TSS	Liming	Al (Filtered)	As	Cd	Cr	Cu	Fe (Filtered)	Pb	Mg	Mn (Filtered)	Mercury	Ni	Se	Zn	Acidity as CaCO3	Alkalinity as CaCO3	Cl	Ec	Lab pH	SO4 (Sulphate)	TDS	SO4:Cl
28/02/2022																													
1/03/2022																													
2/03/2022																													
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24/03/2022																													
28/03/2022																													
4/04/2022																													
12/04/2022	6.56	1500		19.2	24	408	20																						
13/04/2022	6.75	1350		21.1	27		18																						
14/04/2022	6.98	1380		20.5	42		18																						
15/04/2022	6.81	1330		14.2	30	324	10																						
16/04/2022	6.58	1200		15	33	320	16																						
17/04/2022	6.58	1250		13.4	33		15																						
18/04/2022	6.03	1190		13.5	33		40																						
19/04/2022	6.58	1360		19.8	33		20																						
20/04/2022	6.57	1200		16	24	351	33			0.029					0.094			0.044					3	20	338	1250	7	48	630	0.142011834
21/04/2022	6.75	1550		19.3	38	363	14																						
22/04/2022	7.75	1790		15.6	30	339	10																						
23/04/2022	7.55	1780		15.8	33		9																						
24/04/2022	7.38	1790		16.2	30		10																						
25/04/2022	7.06	1680		17.1	30		10																						
26/04/2022	6.8	1730		15.4	27	351	8																						
27/04/2022	6.95	1710		17.9	39	347	9																						
28/04/2022	6.83	1650		18.3	27		8																						
29/04/2022	6.81	1320		18.3	30	274	9																						
30/04/2022	6.74	1730		13.4	27		8																						
1/05/2022	6.85	1690		13.8	30		8																						
2/05/2022	6.69	1650		18.5	30		8																						
3/05/2022	6.84	1610		19.2	30	310	8																						
4/05/2022	6.91	1220		15.7	33	325	8																						
5/05/2022	7.06	1580		15.4	30	333	4																						
6/05/2022																													
7/05/2022																													
8/05/2022	7.06	1390		20.4	24		12																						
9/05/2022	7.2	1360		18.6	30		8																						
10/05/2022	6.54	1550		16	30		20			0.013					0.065			0.056					9	18	355	1270	6.9	40	580	0.112676056
11/05/2022	6.5	1500		15.8	30	332	15																						
12/05/2022	6.72	1840		15.1	24	349	14																						
13/05/2022	7.02	1850		14	33	381	5																						
14/05/2022	7.78	1440		15.5	30		5																						
15/05/2022	6.93	1170		16.2	24		17																						
16/05/2022	7.24	1360		16.1	27		6																						
17/05/2022	6.48	1870		17	30	344	18																						
18/05/2022	6.71	1840		15.1	30	336	16																						
19/05/2022	6.95	1710		16.1	30	399	18																						
20/05/2022	7.77	1720		18	30	411	35																						
21/05/2022	7.17	1550		9.4	33	375	28																						
22/05/2022	7.2	1650		9.4	35	330	20																						
23/05/2022	7.48	1750		15.7	42	339	15																						
24/05/2022	7.57	1550		18.1	21	282	12																						
25/05/2022	7.06	1360		17	30	339	15																						
26/05/2022	7.15	1750		14.5	21	246	18																						
27/05/2022																													
28/05/2022	7.1	1540		6.3	21	262	20																						
29/05/2022	7.62	1490		6.4	24	265	18																						
30/05/2022	6.74	1540		12.1	24	259	15																						
31/05/2022	6.46	1470		16	36	282	16																						
1/06/2022	6.38	2040		16.4	24	381	20																						
2/06/2022	6.74	1480		16.4	30	381	22																						
3/06/2022	6.85	1380		15.6	33	351	22																						
4/06/2022	7.26	1420		16.2	21		11																						
5/06/2022	6.74	1380		15.4	30		7																						
6/06/2022	6.83	1350		16.4	24		7																						
7/06/2022	6.81	1310		17.0	30		8																						
8/06/2022	6.77	1330		13.4	36		17																						
9/06/2022	6.54	1260		14.7	27	300	21																						
10/06/2022	6.43	1220		15.4	27	343	13																						
11/06/2022																													
12/06/2022	7.30	1280		16.4	18	326	7																						
13/06/2022	7.26	1210		15.0	27	315	6																						
14/06/2022	6.19	1280		15.6	27	303	20																						
15/06/2022	6.84	1280		16.1	30	324	15																						
16/06/2022	6.30	1370		18.2	30	318	20																						
17/06/2022	7.34	1370		17.8	30		20																						
18/06/2022	6.88	960		15.0	27		14																						
19/06/2022	6.74	970		16.1	18		14																						
20/06/2022	6.90	980		16.2	27		15																						
21/06/2022	7.12	1000		16.9	30		18																						
22/06/2022	6.14	1160		19	24	343	26																						
23/06/2022	6.6	1320		16.5	45	331	28																						
24/06/2022	7.07	1170		10.9	24	346	12																						
25/06/2022	7.07	1290		11.4	21		8																						
26/06/2022	6.73	1270		9.8	24		15																						
27/06/2022	6.8	1380		17.2	36	375	12																						
28/06/2022	6.67	1620		14.5	27		7																						
29/06/2022	7.46	1540		13.1	30	330	10																						
30/06/2022	7.26	1420		16.1	30	305	20																						
1/07/2022	6.94	1630		13.5	45	334	20																						
2/07/2022	7.27	1510		16.9	27		25																						
3/07/2022	6.8	1500		16.3	21		24																						
4/07/2022	6.9	2720		12.9	36	338	9																						
5/07/2022	7.5	2890		15.1	45	313	15																						
6/07/2022	6.83	1460		12	33	341	18			0.01					0.14			0.071					14	22	335	1220	6.6	33	610	0.098507463
7/07/2022	6.9	1410		12.6	36	401	18																						
8/07/2022	6.86	1360		12.6	30	390	20																						
9/07/2022	6.94	1470		12.5	30		8																						
10/07/2022	6.7	1480		12.7	27		10																						
11/07/2022	6.55	1500		15.9	30		25																						
12/07/2022	6.71	1840		12.1	36	361	24																						
13/07/2022	6.54	1980		17.2	45	346	30																						
14/07/2022	7.33	1430		8.6	24		8																						
15/07/2022	6.45	2000		14.5	27		17																						
16/07/2022	6.88	1980		12.3	30	388	20																						
17/07/2022	7.26	1460		6.8	21	238	6																						
18/07/2022	7.14	1420		15	27		7																						
19/07/2022	7.3	1550		12	36	370	14																						
20/07/2022	7.15	1600		12.6	27	290	15																						
21/07/2022	7.26	1110		15.1	36	363	18																						
22/07/2022	7.2	1200		17	30		18																						
23/07/2022	7.76	1490		7.6	27		5																						
24/07/2022	7.69	1510		6.4	27		6																						
25/07/2022	6.79	1480		16.2	30		20																						
26/07/2022	7.6	1510		8.9	30	343	15																						
27/07/2022	6.86	1500		11.5	30	331	12			0.026					0.46			0.074					22	24	342	1240	6.5	48	590	0.140350877
28/07/2022	6.99	1580		14.9	33	365	15																						
29/07/2022	7.41	1310		11.6	33	338	15																						
30/07/2022	7.42	1430		13.1	78	357	20																						
31/07/2022	6.79	1430		15.5	72	333	22																						
1/08/2022	7.01	1360		14.2	66	356	18																						
2/08/2022																													
3/08/2022	7.13	1270		11.9	45	378	5																						
4/08/2022	6.59	1340		15.3	69	381	23																						
5/08/2022	6.59	1400		16.9	30		10																						
6/08/2022	6.64	1380		10.5	27		8																						
7/08/2022	6.84	1120		10.1	39		6																						
8/08/2022	7.04	1400		15.6	45		13																						
9/08/2022	6.99	1410		14.6	60	330	20																						
10/08/2022	7.21	1380		14.8	54	333	18																						
11/08/2022	6.45	1370		18.2	60	373	26																						
12/08/2022	6.9	1350		15.8	45		21																						
13/08/2022	6.94	1350		12.6	45		6																						
14/08/2022	7.08	1420		13.8	39		8																						
15/08/2022	7.03	1460		20	51		11																						
16/08/2022	7.22	1480		15.6	48	362	20																						
17/08/2022																													
18/08/2022	7.11	1410		17	45	353	18																						
19/08/2022	7.22	1440		18.1	42	360	20																						
20/08/2022	6.89	1530		16.7	48		8																						
21/08/2022	6.81	1530		16.4	48		10																						
22/08/2022	6.35	1250		18.7	45		25																						
23/08/2022	7.58	2050		12.6	84	299	12																						
24/08/2022	7.17	1810		14.8	57	296	12																						
25/08/2022	7.2	1910		15.9	66	286	14																						
26/08/2022	7.2	1660		20.9	63		13																						
27/08/2022	7.33	1530		8.8	57		8																						
28/08/2022	7.31	1510		9.8	54		6																						
29/08/2022	7.91	1700		18	66		8																						
30/08/2022	8.35	1690		18.2	63	340	18			0.034					0.036			0.049					5	65	425	1600	7.9	83	870	0.195294118
31/08/2022	7.2	1580		18.9	45	332	24																						
1/09/2022	7.81	2210		17.5	81	350	14																						
2/09/2022	7.86	2210		22.1	78	345	15																						
3/09/2022	7.83	1890		9.1	69		8																						
4/09/2022	7.41	2100		9	66		10																						
5/09/2022	7.88	1820		17.2	63		6																						
6/09/2022	6.84	1450		17.7	60	420	20																						
7/09/2022	6.99	1410		14.1	57	410	18																						
8/09/2022	6.9	1330		17.7	60	345	20																						
9/09/2022	7.04	1560		18.9	54		15																						
10/09/2022	6.67	1380		17.2	45		22																						
11/09/2022	6.5	1410		18.4	36		30																						
12/09/2022	7.37	1960		19.6	75		15																						
13/09/2022	7.66	1670		16	78		20																						
14/09/2022	6.74	1320		16.4	54	310	15																						
15/09/2022	7.42	1320		16.9	66	274	16																						
16/09/2022	7.69	1890		20.5	66		12																						
17/09/2022	7.3	1590		9.2	66		6																						
18/09/2022	7.4	1600		8.7	60		15																						
19/09/2022																													
20/09/2022	6.96	2110		17	90	326	24																						
21/09/2022	7.01	2010		17.2	90	320	20																						
22/09/2022																													
23/09/2022	7.1	2060		16.6	87	333	15																						
24/09/2022																													
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MINE BLOCK 70

Date	Field pH	EC @ 25 °	TDS	temp	Alkalinity	ROP	TTA	TSS	Liming	Al (Filtered)	As	Cd	Cr	Cu	Fe (Filtered)	Pb	Mg	Mn (Filtered)	Mercury	Ni	Se	Zn	Acidity as CaCO3	Alkalinity as CaCO3	Cl	Ec	Lab pH	SO4 (Sulphate)	TDS	SO4:Cl
28/02/2022																														
1/03/2022																														
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1/10/2022	6.83	1180		14.9	45	338	22																							
2/10/2022	6.65	1200		13.9	51	332	26																							
3/10/2022																														
4/10/2022	6.81	1180		17.5	63	328	33																							
5/10/2022	6.09	1170		17.8	48	330	45																							
6/10/2022	6.4	1180		13.7	36	334	33																							
7/10/2022	7.35	1170		13.5	58	353	40																							
8/10/2022	6.95	1160		9.5	45	349	16																							
9/10/2022	7.01	1150		12	42	340	16																							
10/10/2022	6.99	1200		11.9	42	345	16																							
11/10/2022	6.98	1210		18.4	54	340	18																							
12/10/2022	7.01	1260		18.9	57	320	18																							
13/10/2022	6.92	1300		17.1	66	310	15																							
14/10/2022	6.6	1150		18.9	66	300	25																							
15/10/2022	6.77	1100		17.2	69	310	22																							
16/10/2022	6.66	1180		17.2	60	320	20																							
17/10/2022	6.65	1130		21.4	39		29																							
18/10/2022	6.3	1110		22.5	51	239	30																							
19/10/2022	6.33	1100		21	54	230	20																							
20/10/2022	6.1	1150		21	45		38																							
21/10/2022	6.18	1120		20.2	45		35																							
22/10/2022	6.56	1110		15.8	36		25																							
23/10/2022	6.35	1110		16	30		20																							
24/10/2022	6.47	1140		20.8	30		15																							
25/10/2022	6.2	1150		21.4	45	250	30																							
26/10/2022	6.27	1150		20.8	30	240	20			0.01					0.74			0.053					17	17	297	1050	7	37	550	0.124579125
27/10/2022	6.52	1370		22.4	30		10																							
28/10/2022	6.12	1140		19.7	36	220	18																							
29/10/2022	6.44	1260		10.1	18		19																							
30/10/2022	6.34	1210		9.3	30		20																							
31/10/2022	6.63	1230		18.8	27		20																							
1/11/2022	6.54	1200		17.7	30	230	20																							
2/11/2022	6.29	1360		23.3	42	220	18																							
3/11/2022	6.34	1280		25	48	260	16																							
4/11/2022	6.54	1260		22.3	27		15																							
5/11/2022	6.77	1230		7.8	24		9																							
6/11/2022	6.77	1230		8.2	33		19																							
7/11/2022	6.27	1220		19.6	30		28																							
8/11/2022	6.54	1260		22	39	230	18																							
9/11/2022	6.06	1240		25.2	33	205	35																							
10/11/2022	6.26	1260		17.5	27	275	25																							
11/11/2022	6.66	1260		17.1	33	270	20																							
12/11/2022	6.65	1240		6.9	30		10																							
13/11/2022	6.82	1370		8.2	30		10																							
14/11/2022	6.41	1290		23.1	30		20																							
15/11/2022	6.63	1410		16.4	33	389	13																							
16/11/2022	6.76	1330		21.6	39	348	18																							
17/11/2022	6.65	1260		18.9	24	310	30																							
18/11/2022	6.88	1220		16.8	42		15																							
19/11/2022	6.6	1200		9.2	39		20																							
20/11/2022	6.86	1260		9.7	45		15																							
21/11/2022	6.64	1320		27.1	33		25			0.007					1.5			0.032					9	29	321	1210	6.9	43	610	0.133956386
22/11/2022	6.85	1210		18	45	230	25																							
23/11/2022	6.95	1370		25	39	280	28																							
24/11/2022	7.05	1300		22.7	45	210	14																							
25/11/2022	6.68	1510		23.1	36		26																							
26/11/2022	6.88	1480		14.5	33		15																							
27/11/2022	7	1400		14.4	36		15																							
28/11/2022	6.89	1360		23.2	33		18																							
29/11/2022	6.9	1410		23.2	36	260	16																							
30/11/2022	6.89	1270		26.8	57	280	16			0.022					0.34			0.06					7	100	686	2840	8	310	1500	0.451895044
1/12/2022	6.81	1380		24.1	54	260	18																							
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5/12/2022	6.73	1290		19.5	21		18																							
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8/12/2022	6.9	1570		24.6	30		7																							
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12/12/2022	6.66	2890		22.1	60	282	12			0.057					0.067			0.022					19	46	607	2160	7.1	100	1000	0.164744646
13/12/2022	6.52	2730		21.9	60	272	14																							
14/12/2022	6.42	2650		21.8	57	255	16																							
15/12/2022	6.3	2160		23	60	365	18																							
16/12/2022	6.34	2130		20.3	51		33																							
17/12/2022	6.6	1580		12.3	30		15																							
18/12/2022	6.96	1550		14.1	27		16																							
19/12/2022	6.5	1810		29.2	27		28																							
20/12/2022	6.57	1520		31	27	221	12																							
21/12/2022	6.31	1680		24	33	231	17																							
22/12/2022	6.37	1880		30.8	33	213	18																							
23/12/2022	6.52	1450		21.4	30	211	20																							
24/12/2022	6.66	1490		18.8	27	215	18																							
25/12/2022																														
26/12/2022	6.82	1480		18.9	33	205	18																							
27/12/2022	6.9	1550		19.2	33	210	18																							
28/12/2022	6.92	1610		21.6	30	210	16																							
29/12/2022	6.33	1710		21.9	54	180	24																							
30/12/2022	6.22	1450		29.8	21		18																							
31/12/2022	6.74	1820		12.2	57	198	20																							

MINE BLOCK 72

Date	Field pH	EC @ 25 °	TDS	temp	Alkalinity	ROP	TTA	TSS	Liming	Al (Filtered)	As	Cd	Cr	Cu	Fe (Filtered)	Pb	Mg	Mn (Filtered)	Mercury	Ni	Se	Zn	Acidity as CaCO3	Alkalinity as CaCO3	Cl	Ec	Lab pH	SO4 (Sulphate)	TDS	SO4:Cl
28/02/2022																														
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8/12/2022	6.84	1300		23.2	42		14																							
9/12/2022	6.52	1590		9.8	60	288	42																							
10/12/2022	6.66	1600		9.9	54	285	38																							
11/12/2022	6.92	1400		10.1	57	280	44																							
12/12/2022	6.6	1510		21	48	270	52			0.024					11			0.015					27	35	362	1400	6.9	120	720	0.331491713
13/12/2022	6.31	1490		21.3	45	256	40																							
14/12/2022	6.21	1360		21.8	48	285	40																							
15/12/2022	6.15	1500		23.7	75	260	38																							
16/12/2022	6.57	1350		21.2	42		23																							
17/12/2022	6.68	1320		14.7	33		9																							
18/12/2022	7.08	1290		16.9	27		8																							
19/12/2022	6.52	1390		27.6	57		50																							
20/12/2022	6.61	1360		31.1	33		20																							
21/12/2022	6.41	1350		23.6	33	217	27																							
22/12/2022	6.58	1400		30.4	42	137	25																							
23/12/2022	6.58	1450		16.4	39	120	22																							
24/12/2022	6.4	1520		18.6	60	216	42																							
25/12/2022																														
26/12/2022	6.36	1290		18.1	57	196	39																							
27/12/2022	6.42	1360		18.6	57	130	42																							
28/12/2022	6.4	1370		22.7	60	125	55																							
29/12/2022	6.41	1340		22.2	45	126	52																							
30/12/2022																														
31/12/2022																														

MINE BLOCK 78

Date	Field pH	EC @ 25 °	TDS	temp	Alkalinity	ROP	TTA	TSS	Liming	Al (Filtered)	As	Cd	Cr	Cu	Fe (Filtered)	Pb	Mg	Mn (Filtered)	Mercury	Ni	Se	Zn	Acidity as CaCO3	Alkalinity as CaCO3	Cl	Ec	Lab pH	SO4 (Sulphate)	TDS	SO4:Cl
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28/03/2022																														
4/04/2022	5.05	3050		19.2	9	330	11																							
12/04/2022	5.15	2840		17.2	6	266	20																							
13/04/2022	6.39	2350		19.6	15	412	20																							
14/04/2022	8.35	1820		22.8	30		15		Y																					
15/04/2022	7.15	1830		17.9	30		10																							
16/04/2022	6.79	1610		11.5	33	325	9																							
17/04/2022	6.8	1540		10.6	15	326	10																							
18/04/2022	6.84	1610		12.9	21		8																							
19/04/2022																														
20/04/2022	7.05	1870		21.5	30		9																							
21/04/2022	6.54	1640		16	33	352	20			0.04					0.045			0.36					4	15	466	1780	6.8	130	900	0.278969957
22/04/2022	6.46	1990		19.8	18	366	15																							
23/04/2022	6.25	2450		10.8	15	351	45		Y																					
24/04/2022	6.29	2980		10.3	27		45																							
25/04/2022	6.64	2050		10.1	15		30																							
26/04/2022	6.78	1980		10.6	30		9																							
27/04/2022	6.24	2320		14.6	27	357	17																							
28/04/2022	6.7	2340		17.8	30	350	10																							
29/04/2022	6.56	3200		18.7	27		11																							
30/04/2022	6.06	3860		19.7	36	308	36																							
1/05/2022	5.94	5190		12.7	36		65																							
2/05/2022	6.12	5000		12	36		40																							
3/05/2022	6.9	2520		18.3	33		7																							
4/05/2022	6.82	2780		15.4	30	311	6																							
5/05/2022	6.68	2850		15.6	30	342	11																							
6/05/2022	7.47	3630		16.2	36	346	8																							
7/05/2022																														
8/05/2022																														
9/05/2022	7.53	3470		21.3	45		6																							
10/05/2022	7.04	3750		19	27		20																							
11/05/2022	6.5	4320		16	39		25			0.035					0.21			0.37					15	31	1100	3910	6.9	320	2000	0.290909091
12/05/2022	6.46	4260		15	33	352	20																							
13/05/2022	6.08	4880		14.5	36	374	20																							
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	MINE BLOCK 89																													
Date	Field pH	EC @ 25 °	TDS	temp	Alkalinity	ROP	TTA	TSS	Liming	Al (Filtered)	As	Cd	Cr	Cu	Fe (Filtered)	Pb	Mg	Mn (Filtered)	Mercury	Ni	Se	Zn	Acidity as CaCO3	Alkalinity as CaCO3	Cl	Ec	Lab pH	SO4 (Sulphate)	TDS	SO4:Cl
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26/12/2022																														
27/12/2022																														
28/12/2022																														
29/12/2022																														
30/12/2022	7.08	1820		28.3	75		18																							
31/12/2022	7.76	1730		12.1	42	200	12																							

MINE BLOCK 64

Date	Field pH	EC @ 25 °	TDS	temp	Alkalinity	ROP	TTA
28/02/2022							
1/03/2022							
2/03/2022							
3/03/2022							
4/03/2022							
5/03/2022							
6/03/2022							
7/03/2022							
8/03/2022							
9/03/2022							
10/03/2022							
11/03/2022							
12/03/2022							
13/03/2022							
14/03/2022							
15/03/2022							
16/03/2022							
17/03/2022							
18/03/2022							
19/03/2022							
20/03/2022							
21/03/2022							
22/03/2022							
23/03/2022							
24/03/2022							
28/03/2022							
4/04/2022							
12/04/2022	7.11	1620		20	90	400	25
13/04/2022	7.77	1520		22.8	111		20
14/04/2022	8.1	1590		21.1	105		20
15/04/2022	8.15	1710		14.9	132	327	15
16/04/2022	7.62	1510		13.7	96	324	14
17/04/2022	8.06	1630		13.7	108		12
18/04/2022	8.08	1580		13.4	78		9
19/04/2022	7.6	1540		21.7	90		18
20/04/2022	7.1	1560		17	70	352	34
21/04/2022	7.78	1550		18.7	120	373	15
22/04/2022	8.13	1760		15.2	99	337	12
23/04/2022	8.16	1720		14.7	141		20
24/04/2022	8.14	2070		15.6	144		19
25/04/2022	7.94	1880		16.1	105		20
26/04/2022	8.37	1680		16.4	60	343	15
27/04/2022	7.61	1680		17.6	90	350	15
28/04/2022	7.6	1650		19.7	72		15
29/04/2022	7.67	1690		18.9	78	303	15
30/04/2022	7.7	1680		13	76		12
1/05/2022	7.67	1650		12.9	90		15
2/05/2022	7.7	1930		19.6	93		12
3/05/2022	7.66	1840		19.3	105	309	12
4/05/2022	7.87	1630		14.4	96	335	12
5/05/2022	7.72	1690		17.5	45	336	5
6/05/2022							
7/05/2022							
8/05/2022	7.76	2030		20.5	81		13
9/05/2022	8.16	1940		18.1	75		10
10/05/2022	6.85	1880		15	60		12
11/05/2022	7.65	2230		18.4	81	336	18
12/05/2022	7.64	2230		14.4	90	346	20
13/05/2022	7.79	2100		12.8	78	363	10
14/05/2022	7.6	1570		15.1	48		9
15/05/2022	7.54	1750		14.5	78		11
16/05/2022	7.73	1710		16.7	78		10
17/05/2022	7.02	1860		14.5	45	343	20
18/05/2022	7.46	1590		15	60	332	20
19/05/2022	7.2	1810		16	60	400	18
20/05/2022	7.47	1960		17.2	105	403	18
21/05/2022	7.73	2230		9.6	105	328	25
22/05/2022	7.76	2140		9.6	105	341	22
23/05/2022	7.52	1880		15	48	329	20
24/05/2022	7.84	1330		18.1	69	276	23
25/05/2022	7.12	1390		17	60	351	20
26/05/2022	7.35	1810		14.3	51	248	22
27/05/2022							
28/05/2022							
29/05/2022							
30/05/2022	7.4	1800		11.6	30	263	22
31/05/2022	6.85	1590		16.3	50	299	20
1/06/2022	6.68	1810		16.3	60	380	25
2/06/2022	6.95	1480		16.6	75	390	25
3/06/2022	7.14	1640		15.5	66	360	25
4/06/2022	7.82	1640		15.4	42		10
5/06/2022	7.68	1520		15.9	42		6
6/06/2022	7.70	1560		16.0	45		8
7/06/2022	7.78	1620		15.8	39		10
8/06/2022	7.76	1540		12.1	36		5
9/06/2022	7.46	1740		13.7	57	305	6
10/06/2022	8.07	1550		14.5	87	339	10
11/06/2022							
12/06/2022	8.50	980		16.4	24	309	5
13/06/2022	7.73	1230		15.4	33	312	8
14/06/2022	7.12	1270		15.4	81	301	18
15/06/2022	7.41	1530		16.1	48	327	18
16/06/2022	7.65	1940		19	90	315	22
17/06/2022	7.61	1410		19.2	42		8
18/06/2022	8.31	1390		15.2	57		8
19/06/2022	8.60	1350		15.5	51		5
20/06/2022	8.05	1420		16.1	51		6
21/06/2022	7.20	1520		17.5	54	312	18
22/06/2022	7.25	2060		19.1	50	352	20
23/06/2022	7.23	1920		16.3	60	376	20
24/06/2022	8.36	2420		13.1	81	351	11
25/06/2022	8.43	2390		10.5	72		10
26/06/2022	8.24	1670		10.7	66		11
27/06/2022	7.76	1630		16.8	45	356	10
28/06/2022	7.54	2530		15.5	90		11
29/06/2022	8.17	1850		13.6	99	333	8
30/06/2022	7.31	1570		16.1	60	306	20
1/07/2022	7.42	1600		12.9	51	332	20
2/07/2022	7.80	2450		16.6	75		15
3/07/2022	7.56	1720		16.6	45		9
4/07/2022	7.20	1630		14.3	30	329	14
5/07/2022	8.26	1750		15.3	60	311	20
6/07/2022	7.12	1520		12.2	36	342	18
7/07/2022	7.76	1540		12.6	39	415	20
8/07/2022	7.60	1520		12.4	36	401	20
9/07/2022	8.34	1870		12.4	57		10
10/07/2022	8.00	1800		12.5	54		11
11/07/2022	7.08	1530		16.2	24		10
12/07/2022	7.89	2770		12.5	45	367	18
13/07/2022	8.06	1850		17.7	51	342	20
14/07/2022	8.07	1380		9.0	45		6
15/07/2022	7.92	1330		13.2	96		12
16/07/2022	7.99	1290		12.3	90	350	20
17/07/2022	8.00	2820		8.1	96	213	13
18/07/2022	7.98	2720		15.2	114		18
19/07/2022	8.05	2860		12.0	66	375	22
20/07/2022	7.92	2650		12.0	81	362	18
21/07/2022	8.33	1100		15.2	60	356	18
22/07/2022	7.42	1510		19.3	75		10
23/07/2022	8.03	1590		6.8	45		8
24/07/2022	8.22	1610		6.9	45		8
25/07/2022	7.51	1570		15.9	45		9
26/07/2022	8.15	2000		8.9	105	341	25
27/07/2022	7.41	1690		10.8	72	340	15
28/07/2022	7.65	1720		14.8	90	360	20
29/07/2022							
30/07/2022	7.65	1390		13.0	66	333	25
31/07/2022	7.26	1500		15.5	60	332	24
1/08/2022	7.60	1610		14.5	60	340	22
2/08/2022							
3/08/2022							
4/08/2022							
5/08/2022							
6/08/2022							
7/08/2022							
8/08/2022							
9/08/2022	7.72	1170		15.4	60	334	20
10/08/2022	7.51	1190		16.0	66	310	15
11/08/2022							
12/08/2022							
13/08/2022							
14/08/2022							
15/08/2022							
16/08/2022	7.62	1820		16.9	75	351	12
17/08/2022							
18/08/2022	7.18	940		17.7	75	360	14
19/08/2022							
20/08/2022							
21/08/2022							
22/08/2022							
23/08/2022							
24/08/2022	7.68	1980		15.4	66	292	16
25/08/2022	7.70	1910		16.1	69	290	20
26/08/2022							
27/08/2022							
28/08/2022							
29/08/2022							
30/08/2022	8.22	1880		18.1	105	337	20
31/08/2022	8.17	1930		18.7	78	335	20
1/09/2022	7.86	2140		17.0	90	345	20
2/09/2022							
3/09/2022							
4/09/2022							
5/09/2022							
6/09/2022	7.65	1830		16.8	90	406	20
7/09/2022	7.59	1670		14.5	135	385	25
8/09/2022	7.46	1620		17.4	96	348	18
9/09/2022	7.54	2120		19.5	69		10
10/09/2022	7.64	2480		17.2	84		18
11/09/2022	7.65	2440		17.9	99		15
12/09/2022	7.77	2300		20.6	111		15
13/09/2022	7.96	1810		16.9	99	310	15
14/09/2022	8.13	1850		17.1	114	304	18
15/09/2022	8.07	2430		17.3	108	285	18
16/09/2022	7.97	2300		21.8	84		12
17/09/2022	7.70	2320		9.2	90		10
18/09/2022	7.80	2200		8.9	105		11
19/09/2022	8.04	2710		16.7	51		15
20/09/2022	7.09	1280		17.7	66	314	15
21/09/2022	7.61	1570		14.2	90	333	15
22/09/2022	7.7	1590		10	90	342	15
23/09/2022	7.68	1340		16.7	90	338	15
24/09/2022	7.68	1700		9.3	53	331	16
25/09/2022	7.71	1680		9.3	82	332	16
26/09/2022	7.75	2730		24.1	60	338	10
27/09/2022	7.31	3520		23.5	60	327	16
28/09/2022	7.26	2490		22.1	66	322	16
29/09/2022	7.17	2550		18.5	57	370	16
30/09/2022	7.68	1720		17.7	102	350	31
1/10/2022	7.76	1940		14.6	66	340	22
2/10/2022	8.16	2460		14.7	60	340	18
3/10/2022	7.73	2140		16.3	90	333	20
4/10/2022	7.5	1360		17.7	78	328	14
5/10/2022	7.47	2180		17.7	66	335	14
6/10/2022	7.56	1610		13.1	66	337	14
7/10/2022	7.55	1490		15.2	69	353	20
8/10/2022	7.45	1360		11.2	57	355	16
9/10/2022	7.52	1380		11	63	340	16
10/10/2022	7.61	1510		11.9	69	342	17
11/10/2022	7.45	1510		18.9	87	330	17
12/10/2022	7.11	1580		18.8	105	335	18
13/10/2022	7.82	1610		18.1	96	330	18
14/10/2022	7.66	1420		18.5	102	320	20
15/10/2022	7.56	1560		17.2	96	310	18
16/10/2022	7.62	1480		17.1	87	320	20
17/10/2022	7.71	1740		23.6	66		8
18/10/2022	7.62	1720		20.8	84	330	20
19/10/2022	7.68	1640		20.9	81	315	18
20/10/2022	7.53	1640		20.6	144	310	20
21/10/2022	7.6	1430		20.2	124		15
22/10/2022	8.08	1700		12	90		15
23/10/2022	7.93	1580		12.2	105		14
24/10/2022	8.03	1910		19.4	87		13
25/10/2022	7.55	1900		21.3	66	247	22
26/10/2022	7.5	1510		20	66	232	20
27/10/2022	7.71	1440		22.3	90		10
28/10/2022	7.44	1520		19.6	69	250	18
29/10/2022	7.6	1540		9.7	66		14
30/10/2022	7.4	1490		9.9	72		10
31/10/2022	7.93	1530		18.7	60		10
1/11/2022	7.78	1600		17.8	66	280	15
2/11/2022	7.59	1510		22.3	66	290	16
3/11/2022	7.43	1600		21.4	60	260	20
4/11/2022	7.87	1870		22.6	72		9
5/11/2022	7.7	1580		8.1	60		10
6/11/2022	7.78	1620		8.2	66		11
7/11/2022	7.64	1480		19.3	75		10
8/11/2022	7.61	1480		21.6	99	350	18
9/11/2022	7.27	1460		21.9	66	360	18
10/11/2022	7.72	1420		21.2	72	290	16
11/11/2022	7.7	1400		21	69	310	15
12/11/2022	7.99	1610		8.5	90		9
13/11/2022	7.37	1820		8	75		9
14/11/2022	7.55	1730		20.3	60		9
15/11/2022	8.45	2220		17.2	90	299	18
16/11/2022	8.41	2260		19.6	87	300	18
17/11/2022	7.1	1640		16.2	45	290	24
18/11/2022	7.46	1610		15.8	60		8
19/11/2022	7.5	1580		10	48		10
20/11/2022	7.61	1680		9.8	45		8
21/11/2022	7.49	1720		24.6	69		8
22/11/2022	7.26	1840		16.9	60	366	15
23/11/2022	7.21	1800		19.8	57	350	12
24/11/2022	7.53	1830		22.3	63	266	15
25/11/2022	7.41	1860		23.1	60		10
26/11/2022	7.55	1850		13.4	66		9
27/11/2022	7.43	1920		13.2	72		10
28/11/2022	7.52	2090		20.9	66		10
29/11/2022	7.44	2045		23.2	66	310	15
30/11/2022	7.3	2230		24.7	51	300	16
1/12/2022	7.42	2160		22.6	51	290	18
2/12/2022	7.21	2190		20	72		15
3/12/2022	7.92	2590		10.2	78		10
4/12/2022	8.08	2420		9.2	90		8
5/12/2022	7.41	1910		17.4	63		5
6/12/2022	8.04	1530		20.1	78		5
7/12/2022	7.76	1580		23.9	99		4
8/12/2022	7.8	1920		23	60		8
9/12/2022	7.6	1560		11.6	72	280	18
10/12/2022	7.54	2310		12	87	262	16
11/12/2022	7.52	2230		12.1	84	275	18
12/12/2022	7.65	2800		21.6	60	260	18
13/12/2022	7.66	2780		21.9	63	260	18
14/12/2022	7.52	2690		21.9	67	265	16
15/12/2022	7.42	2580		23.1	66	270	18
16/12/2022	7.82	2790		20.3	75		10
17/12/2022	7.87	2620		11	72		10
18/12/2022	8.2	2590		11.2	87		8
19/12/2022	7.89	2670		28.3	90		11
20/12/2022	7.86	2660		31.3	72		13
21/12/2022	7.48	2630		23.3	90	150	11
22/12/2022	8.04	2470		31.4	75	201	8
23/12/2022	7.88	2320		14.7	66	210	10
24/12/2022	7.77	2220		17.6	66	205	16
25/12/2022							
26/12/2022	7.86	2340		17.1	72	235	14
27/12/2022	7.16	2210		17.2	75	211	18
28/12/2022	7.9	1920		20.1	87	215	16
29/12/2022	7.86	1920		22.1	81	202	16
30/12/2022	7.57	2460		29.5	54		12
31/12/2022	7.87	2070		12.2	75	236	14

Date	TSS	Liming	Al (Filtered)	As	Cd	Cr	Cu	Fe (Filtered)	Pb	Mg	Mn (Filtered)	Mercury	Ni	Se	Zn	Acidity as CaCO3	Alkalinity as CaCO3	Cl	Ec	Lab pH	SO4 (Sulphate)	TDS	SO4:Cl
20/04/2022			0.057					0.17			0.012					2	120	365	1660	7.8	140	840	0.383561644
10/05/2022			0.011					0.034			0.026					3	63	371	1480	7.9	83	690	0.223719677
6/07/2022			0.020					0.015			0.062					6	35	339	1270	7.2	44	630	0.12979351
27/07/2022			0.021					0.060			0.056					11	66	331	1470	7	140	730	0.422960725
26/09/2022			0.013					0.01			0.012					4	120	339	1670	7.6	180	890	0.530973451
26/10/2022			0.03					0.016			0.006					4	99	307	1410	7.9	150	760	0.488599349
21/11/2022			0.021					0.029			0.006					5	73	341	1620	7.6	170	810	0.498533724
30/11/2022			0.029					0.047			0.006					4	92	503	2140	7.9	230	1200	0.457256461
12/12/2022			0.18					0.21			0.008					<2	84	621	2700	8.1	380	1400	0.611916264

APPENDIX F
PROCESS WATER DAM WATER QUALITY DATA

Process Water Dam (PWD) Water Qualtiy

Date	pH	EC	TDS	TTA	Total Alkalinity	Temp	TSS	Acidity as CaCO3	Alkalinity as CaCO3	Cl	EC	pH	SO4 (Sulphate)	TSS	TDS	Al (Filtered)	Al (Total)	As	Cd	Cr	Cu	Fe (Filtered)	Fe (Total)	Pb	Mg	Mn (Filtered)	Mercury	Ni	Se	Zn	Sodium	Thallium	Uranium	Radium 226	Radium 228	S04:Cl ratio
		µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µS/cm		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Bq/L	Bq/L	
24/03/2022	6.54	1440						8	29	326	1210	7.00	46		610	<0.005	<0.005					0.043	0.61			0.96					184					0.141104294
28/03/2022	7.2	1420		9	30	18.7																														
4/04/2022	7.28	1430																																		
12/04/2022	6.83	1470		30	44	20.2		6	29	329	1230	7.50	49		600	0.024	0.2					0.21	2.3			0.93					190					
13/04/2022	6.9	1420		30	45	21.2																														
14/04/2022	7.09	1450		20	33	18.6																														
15/04/2022	6.82	1460		10	33	17																														
16/04/2022	6.92	1480		15	30	13																														
17/04/2022	6.92	1500		18	30	12.5																														
18/04/2022	6.97	1510		12	33	12.5																														
19/04/2022	6.7	1530		18	30	20.6																														
20/04/2022	6.66	1360		18	36	18.2		8	24	360	1440	6.70	96		720	0.15	0.17	0.0001	<0.0001	0.0021	0.0042	0.55	0.55	<0.0001		0.31	<0.00005	0.0028	<0.005		220	<0.0001	<0.0001	<0.01	<0.08	0.266666667
21/04/2022	6.68	1500		15	42	18.6																														
22/04/2022																																				
23/04/2022																																				
24/04/2022																																				
25/04/2022																																				
26/04/2022	6.87	1760		11	30	18.5																														
27/04/2022	6.89	1780		11	39	19																														
28/04/2022	6.86	1820		15	42	18.6																														
29/04/2022	6.8	1470		11	45	18.8																														
30/04/2022	7.36	1940		9	39	13.8																														
1/05/2022	7.36	1970		12	48	14.3																														
2/05/2022	6.89	2000		20	60	19.1																														
3/05/2022	7.03	1960		9	54	16.6																														
4/05/2022	7.21	1630		13	66	17.3																														
5/05/2022	7.5	2030		12	75	17																														
6/05/2022																																				
7/05/2022																																				
8/05/2022	7.76	2030		13	81	20.5																														
9/05/2022	7.72	2070		12	90	20.1																														
10/05/2022	6.9	2270		15	66	18.1		4	84	420	1980	7.90	250		1000	0.069	0.25					0.03	0.14			0.022					285					0.595238095
11/05/2022	7.68	2250		25	75	18.5																														
12/05/2022	7.62	2320		22	75	15.8																														
13/05/2022	7.17	2340		13	75	15.8																														
14/05/2022	7.18	1880		13	78	16.2																														
15/05/2022	7.46	1930		12	84	15.5																														
16/05/2022	7.17	1980		16	93	18.6																														
17/05/2022	7.03	2520		25	90	14.8																														
18/05/2022	7.32	2470		40	90	15.4																														
19/05/2022	6.86	2560		25	100	16.1																														
20/05/2022	6.84	2560		30	110	17																														
21/05/2022	7.31	2660		25	135	9.6																														
22/05/2022	7.76	2340		25	110	9.5																														
23/05/2022	6.86	2710		30	120	15.9																														
24/05/2022	7.9	2440		30	147	18																														
25/05/2022	7.5	2050		25	114	17.4																														
26/05/2022	7.5	2630		28	111	15																														
27/05/2022																																				
28/05/2022	7.66	2860		25	110	6.1																														
29/05/2022	7.66	2860		20	100	6.2																														
30/05/2022	7.3	2890		20	117	13																														
31/05/2022	7.29	2720		29	120	16.1																														
1/06/2022	7.3	2530		22	100	17.1																														
2/06/2022	7.45	2550		30	126	16.9																														
3/06/2022	7.51	2450		30	80	16.2																														
4/06/2022	7.4	2520		6	72	15.3																														
5/06/2022	7.45	2500		13	72	14.6																														
6/06/2022	7.27	2520		10	57	14.5																														
7/06/2022	7.39	2610		10	63	16																														
8/06/2022	7.87	2690		10	90	13.7																														
9/06/2022	7.89	2780		8	90	14.2																														
10/06/2022	7.83	2750		9	87	15																														
11/06/2022																																				
12/06/2022	7.9	2750		10	96	16																														
13/06/2022	7.47	2500		15	72	15.6																														
14/06/2022	7.6	2430		15	84	16.2																														
15/06/2022	7.84	2460		24	81	16.2																														
16/06/2022	7.7	2520		22	66	19																														
17/06/2022	7.9	2620		12	72	17.2																														
18/06/2022	7.76	2760		10	63	15.8																														
19/06/2022	7.91	2740		10	63	14.8																														
20/06/2022	7.88	2620		11	57	15.8																														
21/06/2022	7.6	2590		15	60	17																														
22/06/2022	7.2	2570		15	50	19.1																														
23/06/2022	7.1	2540		18	60	16.3																														
24/06/2022	7.73	2580		10	72	9.7																														
25/06/2022	8.02	2580		13	87	10.4																														
26/06/2022	7.95	2580		11	75	7.9																														
27/06/2022	7.63	2550		13	99	16.6																														
28/06/2022	7.31	2540		8	81	15.7																														
29/06/2022	7.52	2720		13	111	14.2																														
30/06/2022	7.43	2670		18	90	16																														
1/07/2022	7.48	2950		20	90	14.5																														
2/07/2022	7.94	2930		14	105	16.5																														
3/07/2022	8.03	2920		14	81	16.6																														
4/07/2022	7.43	2950		13	99	13.6																														
5/07/2022	7.4	2930		20	114	15.2																														
6/07/2022	7.2	2910		35	96	15		<2	86	560	2630	8.10	350		1400	0.13	0.36	0.0003	<0.0001	0.0005	0.0007	0.038	0.14	0.0002		0.02	<0.00005	0.0007	0.0025	<0.005	406	<0.0001	0.001	0.02	0.08	0.625
7/07/2022	7.2	2900		35	75	13.5																														
8/07/2022	7.2	2290		35	99	12.5																														
9/07/2022	8.01	2970		13	63	12.6																														
10/07/2022	8	2980		12	60	12.8																														
11/07/2022	7.7	2960		16	60	14.7																														
12/07/2022	7.64	3000		30	78	11.9																														
13/07/2022	7.73	2970		38	45	17.3																														
14/07/2022	7.86	2800		16	87	11.4																														
15/07/2022	7.84	2780		15	90	11.9																														
16/07/2022	7.76	2800		20	87	12																														
17/07/2022	7.98	3010		14	90	7.3																														
18/07/2022	7.84	2920		12	54	16																														
19/07/2022	7.8	3000		25	90	11.5																														
20/07/2022	7.85	1890		20	81	12																														
21/07/2022	7.84	2240		30	90	15.5																														
22/07/2022	7.73	2300		15	111	16.3																														
23/07/2022	7.95	3010		20	108	7.6																														
24/07/2022	8.44	3000		20	96	6.2																														
25/07/2022	7.91	2990		12	105	15.7																														
26/07/2022	8.1	2990		30	105	9																														
27/07/2022	7.93	2900		38	129	15		4	140	521	2740	8.00	470		1500	0.042	0.21					0.022	0.15			0.17					383					0.902111324
28/07/2022	8.01	2260		30	105	15.1																														
29/07/2022	7.77	2980		30	120	11.3																														
30/07/2022	7.7	2830		35	120	11.4																														
31/07/2022	7.66	2830		26	96	14.5																														
1/08/2022	7.77	2920		25	105	14.6																														
2/08/2022	7.82	2790		9	75	10.5																														
3/08/2022	7.79	2660		14	72	10.9																														
4/08/2022	7.34	2500		30	66	15.3																														
5/08/2022	7.48	2440		14	72	14.6																														
6/08/2022	7.74	2580		10	66	9.1																														
7/08/2022	7.73	2660		10	63	8																														
8/08/2022	7.77	2530		10	60	16.7																														
9/08/2022	7.67	2390		20	90	15.6																														
10/08/2022	7.55	2220		18	78	15.1																														
11/08/2022	7.6	2100		20	90	18.1																														
12/08/2022	7.87	2220		10	96	16.2																														
13/08/2022	7.82	2350		10	111	11.9																														
14/08/2022	7.65	2390		15	75	13.3																														
15/08/2022	7.68	2380		10	96	20.2																														
16/08/2022	7.45	2310		20	84	16																														
17/08/2022	7.6	2320		12	90	16.6																														
18/08/2022	7.67	2320		14	105	17.7		7	110	427	2240	7.90	330		1200	0.14	1.2					0.0903	0.5			0.069										0.772833724
19/08/2022	7.64	2350		20	105	18.9																														
20/08/2022	7.45	2480		14	96	17																														
21/08/2022	7.5	2490		15	96	16.9																														
22/08/2022	7.65	2550		14	105	17.9																														
23/08/2022	7.96	2470		24	114	12.5																														
24/08/2022	7.82	2550		24	114	15.6																														
25/08/2022	7.77	2420		20	81	16																														
26/08/2022	7.75	2800		15	105	20.3																														
27/08/2022	8.04	2730		18	120	10.1																														
28/08/2022	8.04	2770		20	108	10																														
29/08/2022	7.65	2850		15	108	15.9																														
30/08/2022	7.7	2780		20	105	19.4																														
31/08/2022	7.87	2770		24	96	18.5																														
1/09/2022	7.63	2760		12	105	17.6																														
2/09/2022	7.68	2790		20	114	22																														
3/09/2022	7.7	2800		18	105	9																														
4/09/2022	7.78	2820		20	96	8.9																														
5/09/2022	7.83	2960		20	99	16.8																														
6/09/2022	8.08	2700		20	90	17.7																														
7/09/2022	7.71	2750		20	84	14.4																														
8/09/2022	7.36	2830		18	81	18.2																														
9/09/2022	7.69	3080		7	81	19.1																														
10/09/2022	7.8	2880		15	90	18																														
11/09/2022	7.81	2880		15	81	17.9																														
12/09/2022	7.76	3050		10	81	20.4																														
13/09/2022	7.92	2820		15	78	17.2																														
14/09/2022	7.9	2780		15	114	16.9																														
15/09/2022	7.91	2720		16	99	17																														
16/09/2022	7.99	2960		12	90	21.8																														
17/09/2022	7.87	2750		12	96	9																														
18/09/2022	7.91	2800		10	90	8.9																														
19/09/2022	7.53	2760		11	54	16.9																														
20/09/2022	7.28	2810		15	90	19.1																														
21/09/2022	7.52	2760		20	78	18																														
22/09/2022	7.91	2890		15	81	16.6																														
23/09/2022	7.37	2380		16	66	16.6																														
24/09/2022	7.48	2830		20	69	10.5																														
25/09/2022	7.57	2820		18	72	12																														
26/09/2022	6.79	2890		14	36	23.6																														
27/09/2022	7.41	2750		20	36	23.6																														
28/09/2022	7.62	2750		18	36	22																														
29/09/2022	7.17	2890		19	53	18.9																														
30/09/2022	7.3	2820		17	60	19.2																														
1/10/2022	7.48	2600		22	63	15.4																														
2/10/2022	7.5	2520		16	66	14.7																														
3/10/2022	7.45	2560		20	66	16.1																														
4/10/2022	7.24	2630		16	57	17.9																														
5/10/2022	7.33	2640		19	60	17.7																														
6/10/2022	7.18	2610		20	57	14.5																														
7/10/2022	7.36	2630		16	57	14.2																														
8/10/2022	7.32	2550		15	66	11																														
9/10/2022	7.32	2600		16	60	11.2																														
10/10/2022	7.65	2450		16	57	12																														
11/10/2022	7.62	2710		16	66	18.1																														
12/10/2022	7.83	2770		18	93	19.2																														
13/10/2022	7.62	2660		16	87	18.1																														
14/10/2022	7.77	2730		18	63	16.6																														
15/10/2022	7.68	2700		16	66	17.2																														
16/10/2022	7.67	2650		18	69	17.4																														
17/10/2022	8.08	2790		14	93	22.3																														
18/10/2022	7.76	2630		16	66	20.1																														
19/10/2022	7.62	2600		18	69	21.1		4	100	620	2630	8.10	400	1700		0.041	0.64	0.0005	<0.0001	<0.0001	0.0006	0.027	0.13	0.0002		0.016	<0.00005	0.0006	0.0011	<0.005	414	<0.0001	0.0024	0.02	<0.08	0.64516129
20/10/2022	7.89	2830		22	117	20.3																														
21/10/2022	7.7	2800		20	105	20.3																														
22/10/2022	8.04	2880		14	90	9.5																														
23/10/2022	7.84	2860		14	90	9.9																														
24/10/2022	7.7	2820		12	81	19.1																														
25/10/2022	7.99	2850		18	105	21.4																														
26/10/2022	7.6	2860		18	90	19.1																														
27/10/2022	7.68	2750		11	81	21.9																														
28/10/2022	7.77	2780		20	90	19.6																														
29/10/2022	7.6	2750		10	105	9.5																														
30/10/2022	7.68	2820		15	90	9.6																														
31/10/2022	7.55	2990		13	87	17.5																														
1/11/2022	7.46	2850		15	84	17																														
2/11/2022	7.44	2930		18	78	21.3																														
3/11/2022	7.65	2880		18	72	18																														
4/11/2022	7.8	2900		18	99	21.3																														
5/11/2022	7.77	2920		15	96	8.7																														
6/11/2022	7.6	2880		13	87	8.8																														
7/11/2022	7.67	2950		15	90	20																														
8/11/2022	7.38	2970		15	84	22.8																														
9/11/2022	7.42	2930		16	78	22.2																														
10/11/2022	7.62	2890		18	78	23.2																														
11/11/2022	7.66	2910		15	66	22.3																														
12/11/2022	7.85	2880		11	66	10.2																														
13/11/2022	7.91	2910		15	75	9.6																														
14/11/2022	7.69	2940		12	90	19.6																														
15/11/2022	7.65	2850		18	75	17.1																														
16/11/2022	7.73	2960		18	78	20.8		3	78	697	2790	7.80	340		1700	0.11	0.27					0.047	0.072			0.03					435					0.487804878
17/11/2022	7.62	2980		18	73	17.9																														
18/11/2022	7.36	2810		8	60	16.3																														
19/11/2022	7.12	2750		15	45	9.9																														
20/11/2022	7.06	2640		10	45	9.8																														
21/11/2022	7.29	2700		8	48	24.2																														
22/11/2022	7.2	2690		18	51	17.5																														
23/11/2022	7.25	2610		16	60	19.6																														
24/11/2022	7.66	2820		18	63	23.2																														
25/11/2022	7.81	2800		10	90	23.1																														
26/11/2022	7.86	2820		12	96	13.5																														
27/11/2022	7.94	2790		11	90	13.2																														
28/11/2022	7.87	2790		15	90	21.6																														
29/11/2022	7.76	2700		15	96	22.4																														
30/11/2022	7.38	2840		18	87	24.2		8	91	662	2820	7.80	310		1500	0.11	0.7					0.71				0.056					470					0.468277946
1/12/2022	7.44	2770		16	84	22.9																														
2/12/2022	7.16	2790		10	60	23.5																														
3/12/2022	7.39	2790		11	60	8.3																														
4/12/2022	7.31	2770		8	60	9.1																														
5/12/2022	7.23	2740		10	60	20.5																														
6/12/2022	7.44	2160		8	63	18.2																														
7/12/2022	7.51	2130		9	60	23																														
8/12/2022	7.12	2670		10	48	23.6																														
9/12/2022	7.68	2540		18	81	15.6																														
10/12/2022	7.32	2510		16	87	15.9																														
11/12/2022	7.23	2640		18	87	16.2																														
12/12/2022	7.39	2700		22	90	21.4		6	62	621	2580	7.60	310		1400	0.019	0.63	0.0006	<0.0001	0.0006	0.0021	0.024	0.63	0.0005		0.066	<0.00005	0.0018	0.0019	<0.005	401	<0.0001	0.001	0.03	<0.08	0.499194847
13/12/2022	7.44	2610		18	87	21																														
14/12/2022	7.58	2650		16	84	22																														
15/12/2022	7.6	2690		16	81	23.6																														
16/12/2022	7.28	2760		15	81	20.7																														
17/12/2022	7.57	2680		11	90	9																														
18/12/2022	7.64	2740		12	105	8.5																														
19/12/2022	7.33	2570		17	75	26																														
20/12/2022	7.34	2260		20	90	28.6																														
21/12/2022	6.9	1690		15	60	23.9																														
22/12/2022	7.4	1930		16	75	31																														
23/12/2022	6.8	1690		16	66	14.4																														
24/12/2022	7.01	1720		16	69	17.7																														
25/12/2022																																				
26/12/2022	6.98	1610		18	63	17.6																														
27/12/2022	6.91	1630		12	60	17.1																														
28/12/2022	7.01	1620		16	72	21.9																														
29/12/2022	7.01	1680		18	66	25.5																														
30/12/2022	7.5	1710		5	36	27.4																														
31/12/2022	7.57	1810		18	60	12																														

APPENDIX G
OFF-SITE DISCHARGE WATER QUALITY DATA

LICENCED DISCHARGE POINT W1

Date	Comments	pH	EC	TDS	TTA	Total Alkalinity	Temp	TSS	V Notch reading	Flow (m3/h)	Discharge per day (m3)	Cumulative discharge (m3)	Time reading taken	Acidity as CaCO3	Alkalinity as CaCO3	Cl	EC	pH	SO4 (Sulphate)	TSS	TDS	Al (Filtered)	Al (Total)	As (Total)	Co (Total)	Cr (Total)	Cu (Total)	Fe (Filtered)	Pb	Mg	Mn (Filtered)	Mercury	Ni (Total)	Se (Total)	Zn (Total)	U (Total)	TRH C6-C10	TRH >C10-C16	TRH >C16-C34	TRH >C34-C40	Total TRHs	Sodium	Nitrate
			µS/cm	mg/L	mg/L	mg/L	°C	mg/L						mg/L	mg/L	mg/L	µS/cm		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ORG015W	ORG015W	ORG015W	ORG015W	ORG015W	mg/L	mg/L
17/06/2022	started	7.9	2620	1310	12	72	17.2		0.06	2.63	63	63	1100	5	70	524	2520	7.7	410	26	1500	0.087	0.69	0.0003	0.0006	0.0009	0.0006	0.06			0.064		0.001	0.0025	<0.005	0.001	<25	<25	<100	<100	<250	359	<0.01
18/06/2022	stopped										0	63	600																														
2/07/2022	started	7.86	2750	1370	15	105			0.2	52.04	1249	1312	2100	<2	110	556	2620	8.2	350	16	1300	0.012	0.43	0.0003	0.0002	0.0002	<0.0001	0.009			0.019		<0.0005	0.0022	<0.005	0.0021	<25	<25	<100	<100	<250	405	2.7
3/07/2022	mid flow	8.04	2860	1430					0.14	21.1	506	1818	1130																														
4/07/2022	mid flow	7.43	2950	1470	13	99	13.6		0.12	14.88	357	2175	1230																														
5/07/2022	mid flow	7.4	2930	1470	20	114	15.2		0.1	9.2	221	2396	500																														
5/07/2022	mid flow								0.1	9.2	221	2617	1100																														
6/07/2022	mid flow	7.2	2910	1450	35	96	15		0.05	0	0	2617	1130																														
6/07/2022	stopped										0	2617	1500																														
7/07/2022	started	7.2	2900	1450	35	75	13.5		0.22	64.68	1552	4169	1130																														
8/07/2022	mid flow	7.2	2290	1150	35	99	12.5		0.25	89.53	2149	6318	845																														
9/07/2022	mid flow	8.01	2970	1440	13	63	12.6		0.2	52.04	1249	7567	2000																														
9/07/2022	mid flow								0.1	9.2	221	7788	2300																														
10/07/2022	stopped	8	2980	1450	12	60	12.8				0	7788	100																														
18/07/2022	started	7.57	3000	1500					0.05	0	0	7788	0	4	110	601	2720	8.1	340	25	1500	0.051	0.28	0.0006	0.0007	0.0008	0.0014	0.035			0.04		0.0011	0.0019	<0.005	0.0052	<25	<25	<100	<100	<250	455	3.6
18/07/2022	mid flow	7.84	2920	1450	12	54	16		0.05	0	0	7788	1000																														
19/07/2022	mid flow	7.8	3000		25	90	11.5		0.1	9.2	221	8009	815																														
20/07/2022	mid flow	7.85	1890	950	20	81	12		0.1	0.2	5	8013	1200																														
21/07/2022	mid flow	7.84	2240	1120	30	90	15.5		0.25	89.53	2149	10162	1020																														
22/07/2022	mid flow	7.73	2300	1500	15	111	16.3		0.15	25.99	624	10786	1000																														
23/07/2022	mid flow	7.95	3010	1500	20	108	7.6		0.19	46.32	1112	11898	900																														
24/07/2022	mid flow	8.44	3000	1500	20	96	6.2		0.25	89.53	2149	14046	800																														
25/07/2022	mid flow	7.91	2990	1490	12	105	15.7		0.2	52.04	1249	15295	1130																														
26/07/2022	mid flow	8.1	2990	1500	30	105	9		0.15	25.99	624	15919	1200																														
27/07/2022	mid flow	7.93	2900	1450	38	129	15		0.17	34.51	828	16747	930																														
28/07/2022	mid flow	8.01	2260	1130	30	105	15.1		0.24	81.57	1958	18705	1215																														
29/07/2022	mid flow	7.77	2980	1490	30	120	11.3		0.24	81.57	1958	20663																															
30/07/2022	mid flow	7.7	2830	1415	35	120	11.4		0.25	89.53	2149	22811	1100																														
31/07/2022	mid flow	7.66	2830	1415	26	96	14.5		0.24	81.57	1958	24769	1100																														
1/08/2022	mid flow	7.77	2920	1450	25	105	14.6		0.24	81.57	1958	26727																															
2/08/2022	mid flow	7.82	2790	1400	9	75	10.5		0.44	372.3	8935	35662	1230																														
3/08/2022	mid flow	7.79	2660	1330	14	72	10.9		0.3	143.4	3442	39104	730																														
4/08/2022	mid flow	7.34	2500	1250	30	66	15.3		0.05	0	0	39104	1130																														
5/08/2022	stopped	7.48	2440	1220	14	72	14.6				0	39104	900																														
6/08/2022	stopped	7.74	2580	1300	10	66	9.1				0	39104																															
7/08/2022	started	7.73	2660	1340	10	63	8		0.05	0	0	39104	700	3	74	528	2300	7.8	340	28	1400	0.11	0.36	0.0003	0.0006	0.0006	0.0006	0.065			0.042		0.001	0.001	<0.005	0.0007	<25	<25	<100	<100	<250	358	3.2
8/08/2022	mid flow	7.77	2530	1260	10	60	16.7		0.15	25.99	624	39727	730																														
9/08/2022	mid flow	7.67	2390	1200	20	90	15.6		0.46	412	9888	49615	900																														
10/08/2022	mid flow	7.55	2220	1120	18	78	15.1		0.4	294.4	7066	56681	945																														
11/08/2022	mid flow	7.6	2100	1050	20	90	18.1		0.15	25.99	624	57305	1230																														
12/08/2022	mid flow	7.87	2220	1120	10	96	16.2		0.2	52.04	1249	58554	1030																														
13/08/2022	mid flow	7.82	2350	1170	10	111	11.9		0.14	21.1	506	59060	900																														
14/08/2022	mid flow	7.65	2390	1190	15	75	13.3		0.2	52.04	1249	60309	1200																														
15/08/2022	mid flow	7.68	2380	1190	10	96	20.2		0.28	119.4	2866	63175	700																														
16/08/2022	mid flow	7.45	2310	1160	20	84	16		0.32	166.1	3986	67161	1100																														
17/08/2022	mid flow	7.6	2320	1160	12	90	16.6		0.28	119.4	2866	70027	1100																														
18/08/2022	mid flow	7.67	2320	1160	14	105	17.7		0.3	143.4	3442	73468	1020																														
19/08/2022	mid flow	7.64	2350	1170	20	105	18.9		0.2	52.04	1249	74717	1020																														
20/08/2022	mid flow	7.45	2480	1250	14	96	17		0.27	109.9	2638	77355	900																														
21/08/2022	mid flow	7.5	2490	1250	15	96	16.9		0.25	89.53	2149	79503	730																														
22/08/2022	mid flow	7.65	2550	1270	14	105	17.9		0.38	256.9	6166	85669	1000																														
23/08/2022	mid flow	7.96	2470	1230	24	114	12.5		0.25	92.29	2215	87884	1500																														
24/08/2022	mid flow	7.82	2550	1270	24	114	15.6		0.2	52.04	1249	89133	1000																														
25/08/2022	mid flow	7.77	2420	1220	20	81	16		0.2	52.04	1249	90382	1130																														
26/08/2022	mid flow	7.75	2800	1400	15	105	20.3		0.03	0	0	90382	700																														
26/08/2022	stopped										0	90382	1500																														
13/09/2022	started	7.92	2820	1410	15	78	17.2		0.12	14.88	357	90739	822	4	120	590	2910	7.9	460	19	1700	0.044	0.21	0.0008	0.0038	0.0002	0.0016	0.033			0.089		0.0051	0.0023	<0.005	0.011	<25	<25	<100	<100	<250	426	
14/09/2022	mid flow	7.9	2780	1390	15	114	16.9		0.15	25.99	624	91363	623																														
15/09/2022	mid flow	7.91	2720	1360	16	99	17		0.24	81.57	1958	93321	957																														
10/10/2022	Started	7.65	2450	1220	16	57	12		0.1	9.199	221	93541	1208	3	67	645	2700	7.8	380	12	1500	0.025	0.28	0.0003	0.0005	0.0002	0.0004	0.01			0.032		0.0006	0.0011	<0.005	0.0008	<25	<25	<100	<100	<250	418	3.7
11/10/2022	mid flow	7.62	2710	1350	16	66	18.1		0.22	66.95	1607	95148	925																														
12/10/2022	mid flow	7.83	2770	1380	18	93	19.2		0.23	74.04	1777	96925	1147																														
13/10/2022	mid flow	7.62	2660	1330	16	87	18.1		0.2	66.95	1607	98532	930																														
14/10/2022	mid flow	7.77	2730	1360	18	63	16.6		0.2	66.95	1607	100139																															
15/10/2022	mid flow	7.6	2700	1350	16	66	17.4		0.25	89.53	2149	102287	1530																														
16/10/2022	mid flow	7.67	2650	1320	18	69	17.4		0.25	89.53	2149	104436																															
17/10/2022	mid flow	8.08	2790	1400	14	93	22.3		0.05	0	0	104436	1000																														
17/10/2022	stopped										0	104436	1300																														
18/11/2022	Started	7.36	2810	1410	8	60	16.3		0.05	0	0	104436	715	3	57	659	2740	7.6	659	19	1600	0.059	0.19	0.0004	0.0016	0.0002	0.0007	0.14			0.069	0.19	0.0022	0.0014	<0.005	0.0006	<25	<25	<100	<100	<250	414	4
18/11/2022	mid flow								0.1	9.199	221	104657	1015																														
19/11/2022	mid flow	7.12	2750	1370	15	45	9.9		0.3	143.4	3442	108098	930																														
20/11/2022	mid flow	7.06	2640	1320	10	45	9.8		0.32	166.1	3986	112085	750																														
21/11/2022	mid flow	7.29	2700	1350	8	48	24.2		0.05	0	0	112085	1210																														
22/11/2022	mid flow	7.2	2690	1340	16	57	17.5		0.15	25.99	624	112709	745																														
23/11/2022	stopped	7.28	2610	1305	16	60	19.6		0		0	112709	1000																														
2/02/2023	Started	7.62	1910	950	12	72	22.1		0.2	52.04	1249	1249	1430																														
3/02/2023	mid flow										0																																
4/02/2023	mid flow	7.77	1920	950	12	87	15.1		0.19	46.32	1112	2361	800																														
5/02/2023	mid flow										0																																
6/02/2023	mid flow	7.9	2260	1130	12	90	27.4		0.12	14.88	357	2718	945																														
7/02/2023	stopped										0		345																														

EMERGENCY DISCHARGE POINT E1

Date	Comments	pH-Field	EC-Field	TDS Field	Field TTA	Field Alkalinity	Field TSS	Meter reading (m3)	Time	Usage (Discharge)	Usage (Total)	TTA Lab	Alkalinity Lab	Cl	Sulphate	EC-Lab	pH-Lab	Lab TSS	Lab TDS
9/08/22	Started	7.18	1430	720	20	66						4	69	269	170	1310	7.7	160	730
9/08/22												6			98	907	7.4	20	520
9/08/22												6			78	772	7.3	17	460
10/08/22	mid flow	7.1	1260	630	18	45													
11/08/22	mid flow	7.21	1850	920	20	42						3			290	2120	7.9	26	1110
11/08/22												6			110	1060	7.4	8	610
12/08/22	mid flow	7.89	2340	1160	12	90													
13/08/22																			
14/08/22																			
15/08/22	Stopped																		
16/08/22	Started	7.45	1430	720	20	35													
17/08/22	mid flow	7.68	2200	1100	12	96						4	97	424	300	2170	7.9	50	1200
18/08/22	mid flow	7.6	2180	1090	18	87													
18/08/22	Started							2746764	1145										
18/08/22	Stopped							2748601	1500	1837	1837								
13/09/22	Started	7.58	2490	1250				2748601	2305			3	100	487		2340	7.8	65	1300
14/09/22	Stopped							2751111	250	2510	4347								
7/10/22	Started	7.54	2430	1215	17	72		2751111	1500			2	79	597	350	2590	7.8	24	1400
7/10/22	Stopped								1700										
9/10/22	Started	7.76	2610	1200	18	72			840										
9/10/22	Stopped							2755958	1240	4847	7357								
13/10/22	Started											4	100	602	380	2530	7.9	5	1600
13/10/22	Stopped							2757674		1716	9073								

Date	Al (filtered)	Fe	Mn	Sodium	Nitrate	Al (total)	As (Arsenic)	Cr (Chromium)	Cu (Copper)	Co (Cobalt)	Ni (Nickel)	Se (Selenium)	U (Uranium	Zn (Zinc)
9/08/22	0.24	0.36	0.028	179	1.5	1.8	0.0006	0.0015	0.0018	0.001	0.0019	0.0006	0.0008	0.006
9/08/22														
9/08/22														
10/08/22														
11/08/22														
11/08/22														
12/08/22														
13/08/22														
14/08/22														
15/08/22														
16/08/22														
17/08/22	0.17	0.1	0.033	305	2.2	2.1	0.0005	0.0008	0.0012	0.0013	0.0021	0.0011	0.0053	<0.005
18/08/22														
18/08/22														
18/08/22														
13/09/22	0.014	0.006	0.046	331		1	0.0007	0.0005	0.0011	0.0024	0.0033	0.0017	0.008	<0.005
14/09/22														
7/10/22	0.017	0.01	0.024	391	3.2	0.43	0.0003	<0.0001	0.0005	0.0005	0.0007	0.0011	0.0014	<0.005
7/10/22														
9/10/22														
9/10/22														
13/10/22	0.023	0.019	0.016	399	3.9	0.12	0.0004	<0.0001	0.0007	0.0006	0.0007	0.001	0.0025	<0.005
13/10/22														

Date	BENZENE	TOLUENE	ETHYLBENZENE	XYLENE	TOTAL BTEX	TPH C6 - C10	TPH > C10 - C16	TPH > C16 - C34	TPH >C34 - C40	TOTAL TRHs	m3/hr	Pump start	Pump stop	hr flowed	Volume (m3)	
9/08/22						<25	<25	<100	<100	<250						
9/08/22																
9/08/22																
10/08/22																
11/08/22																
11/08/22																
12/08/22																
13/08/22																
14/08/22																
15/08/22																
16/08/22																
17/08/22						<25	<25	<100	<100	<250						
18/08/22																
18/08/22																
18/08/22																
13/09/22						<25	<25	<100	<100	<250						
14/09/22																
7/10/22						<25	<25	<100	<100	<250						
7/10/22																
9/10/22																
9/10/22																
13/10/22						<25	<25	<100	<100	<250						
13/10/22																

APPENDIX H
SURFACE WATER QUALITY DATA

YALSW01 Original Sabina River channel. Limited area surface flows ~1km downstream from Sabina Diversion weir.

Month		Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17
Date								18/07/17	14/08/17	18/09/17	10/10/17	2/11/17	5/12/17
Comments								Dry		Dry	Dry	Dry	Dry
Flow									0.5				
pH Field									6.63				
EC Field	uS/cm								390				
Salinity	ppm								200				
Acidity as CaCO3	mg/L								15				
NH3-N	mg/L												
EC Lab	uS/cm								355				
Mg	mg/L												
pH Lab									6.7				
Sulphate	mg/L								28				
TDS	mg/L								180				
TSS	mg/L								10				
Al	mg/L												
As (Arsenic)	mg/L												
Cr (Chromium)	mg/L												
Cu (Copper)	mg/L												
Pb (Lead)	mg/L												
Ni (Nickel)	mg/L												
Zn (Zinc)	mg/L												
BENZENE	ug/L												
TOLUENE	ug/L												
ETHYLBENZENE	ug/L												
XYLENE	ug/L												
TOTAL BTEX	ug/L												
TRH C6 - C9	ug/L												
TRH C10 - C14	ug/L												
TRH C15 - C28	ug/L												
TRH C29 - C36	ug/L												
TOTAL TPH	ug/L												
Chloride, Cl	mg/L												
Calcium, Ca	mg/L												
Sodium, Na	mg/L												
RA-226													
RA-228													
Acrylamides													
Acrylic Acid													
TRH Surrogate (o-terphenyl)													

Month		Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
Date		2/01/18	1/02/18	1/03/18	3/04/18	1/05/18	5/06/18	3/07/18	2/08/18	4/09/18	2/10/18	1/11/18	3/12/18
Comments		Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry		Dry	Dry	Dry
Flow										0.25			
pH Field										6.84			
EC Field	uS/cm									980			
Salinity	ppm									490			
Acidity as CaCO3	mg/L									22			
NH3-N	mg/L												
EC Lab	uS/cm									827			
Mg	mg/L												
pH Lab										6.7			
Sulphate	mg/L									70			
TDS	mg/L									444			
TSS	mg/L									23			
Al	mg/L												
As (Arsenic)	mg/L												
Cr (Chromium)	mg/L												
Cu (Copper)	mg/L												
Pb (Lead)	mg/L												
Ni (Nickel)	mg/L												
Zn (Zinc)	mg/L												
BENZENE	ug/L												
TOLUENE	ug/L												
ETHYLBENZENE	ug/L												
XYLENE	ug/L												
TOTAL BTEX	ug/L												
TRH C6 - C9	ug/L												
TRH C10 - C14	ug/L												
TRH C15 - C28	ug/L												
TRH C29 - C36	ug/L												
TOTAL TPH	ug/L												
Chloride, Cl	mg/L												
Calcium, Ca	mg/L												
Sodium, Na	mg/L												
RA-226													
RA-228													
Acrylamides													
Acrylic Acid													
TRH Surrogate (o-terphenyl)													

Month		Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
Date		2/01/19	4/02/19	1/03/19	1/04/19	1/05/19	4/06/19	2/07/19	5/08/19	3/09/19	2/10/19	5/11/19	2/12/19
Comments		Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
Flow													
pH Field													
EC Field	uS/cm												
Salinity	ppm												
Acidity as CaCO3	mg/L												
NH3-N	mg/L												
EC Lab	uS/cm												
Mg	mg/L												
pH Lab													
Sulphate	mg/L												
TDS	mg/L												
TSS	mg/L												
Al	mg/L												
As (Arsenic)	mg/L												
Cr (Chromium)	mg/L												
Cu (Copper)	mg/L												
Pb (Lead)	mg/L												
Ni (Nickel)	mg/L												
Zn (Zinc)	mg/L												
BENZENE	ug/L												
TOLUENE	ug/L												
ETHYLBENZENE	ug/L												
XYLENE	ug/L												
TOTAL BTEX	ug/L												
TRH C6 - C9	ug/L												
TRH C10 - C14	ug/L												
TRH C15 - C28	ug/L												
TRH C29 - C36	ug/L												
TOTAL TPH	ug/L												
Chloride, Cl	mg/L												
Calcium, Ca	mg/L												
Sodium, Na	mg/L												
RA-226													
RA-228													
Acrylamides													
Acrylic Acid													
TRH Surrogate (o-terphenyl)													

Month		Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Date		2/01/20	3/02/20	3/03/20	1/04/20	1/05/20	2/06/20	1/07/20	3/08/20	1/09/20	1/10/20	2/11/20	1/12/20
Comments		Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
Flow													
pH Field													
EC Field	uS/cm												
Salinity	ppm												
Acidity as CaCO3	mg/L												
NH3-N	mg/L												
EC Lab	uS/cm												
Mg	mg/L												
pH Lab													
Sulphate	mg/L												
TDS	mg/L												
TSS	mg/L												
Al	mg/L												
As (Arsenic)	mg/L												
Cr (Chromium)	mg/L												
Cu (Copper)	mg/L												
Pb (Lead)	mg/L												
Ni (Nickel)	mg/L												
Zn (Zinc)	mg/L												
BENZENE	ug/L												
TOLUENE	ug/L												
ETHYLBENZENE	ug/L												
XYLENE	ug/L												
TOTAL BTEX	ug/L												
TRH C6 - C9	ug/L												
TRH C10 - C14	ug/L												
TRH C15 - C28	ug/L												
TRH C29 - C36	ug/L												
TOTAL TPH	ug/L												
Chloride, Cl	mg/L												
Calcium, Ca	mg/L												
Sodium, Na	mg/L												
RA-226													
RA-228													
Acrylamides													
Acrylic Acid													
TRH Surrogate (o-terphenyl)													

Month		Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
Date		4/01/21	1/02/21	2/03/21	1/04/21	3/05/21	1/06/21	1/07/21	2/08/21	1/09/21	11/10/21	28/10/21	8/12/21
Comments		Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry				Dry
Flow										0	0	0	
pH Field										7.03			
EC Field	uS/cm									1040			
Salinity	ppm									520			
Acidity as CaCO3	mg/L									25			
NH3-N	mg/L												
EC Lab	uS/cm									963			
Mg	mg/L												
pH Lab										7.1			
Sulphate	mg/L									69			
TDS	mg/L									520			
TSS	mg/L									51			
Al	mg/L												
As (Arsenic)	mg/L												
Cr (Chromium)	mg/L												
Cu (Copper)	mg/L												
Pb (Lead)	mg/L												
Ni (Nickel)	mg/L												
Zn (Zinc)	mg/L												
BENZENE	ug/L												
TOLUENE	ug/L												
ETHYLBENZENE	ug/L												
XYLENE	ug/L												
TOTAL BTEX	ug/L												
TRH C6 - C9	ug/L												
TRH C10 - C14	ug/L												
TRH C15 - C28	ug/L												
TRH C29 - C36	ug/L												
TOTAL TPH	ug/L												
Chloride, Cl	mg/L												
Calcium, Ca	mg/L												
Sodium, Na	mg/L												
RA-226													
RA-228													
Acrylamides													
Acrylic Acid													
TRH Surrogate (o-terphenyl)													

Month		Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
Date		6/01/22	3/02/22	8/03/22	19/04/22	2/05/22	22/06/22	27/07/22	30/08/22	26/09/22	26/10/22	17/11/22	15/12/23
Comments		Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	0	Dry	Dry	Dry
Flow													
pH Field													
EC Field	uS/cm												
Salinity	ppm												
Acidity as CaCO3	mg/L												
NH3-N	mg/L												
EC Lab	uS/cm												
Mg	mg/L												
pH Lab													
Sulphate	mg/L												
TDS	mg/L												
TSS	mg/L												
Al	mg/L												
As (Arsenic)	mg/L												
Cr (Chromium)	mg/L												
Cu (Copper)	mg/L												
Pb (Lead)	mg/L												
Ni (Nickel)	mg/L												
Zn (Zinc)	mg/L												
BENZENE	ug/L												
TOLUENE	ug/L												
ETHYLBENZENE	ug/L												
XYLENE	ug/L												
TOTAL BTEX	ug/L												
TRH C6 - C9	ug/L												
TRH C10 - C14	ug/L												
TRH C15 - C28	ug/L												
TRH C29 - C36	ug/L												
TOTAL TPH	ug/L												
Chloride, Cl	mg/L												
Calcium, Ca	mg/L												
Sodium, Na	mg/L												
RA-226													
RA-228													
Acrylamides													
Acrylic Acid													
TRH Surrogate (o-terphenyl)													

Month		Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23
Date								
Comments								
Flow								
pH Field								
EC Field	uS/cm							
Salinity	ppm							
Acidity as CaCO3	mg/L							
NH3-N	mg/L							
EC Lab	uS/cm							
Mg	mg/L							
pH Lab								
Sulphate	mg/L							
TDS	mg/L							
TSS	mg/L							
Al	mg/L							
As (Arsenic)	mg/L							
Cr (Chromium)	mg/L							
Cu (Copper)	mg/L							
Pb (Lead)	mg/L							
Ni (Nickel)	mg/L							
Zn (Zinc)	mg/L							
BENZENE	ug/L							
TOLUENE	ug/L							
ETHYLBENZENE	ug/L							
XYLENE	ug/L							
TOTAL BTEX	ug/L							
TRH C6 - C9	ug/L							
TRH C10 - C14	ug/L							
TRH C15 - C28	ug/L							
TRH C29 - C36	ug/L							
TOTAL TPH	ug/L							
Chloride, Cl	mg/L							
Calcium, Ca	mg/L							
Sodium, Na	mg/L							
RA-226								
RA-228								
Acrylamides								
Acrylic Acid								
TRH Surrogate (o-terphenyl)								

YALSW02 Artificial drainage flows from paddocks within Lot 421

Month		Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
Date								18/07/17	14/08/17	18/09/17	10/10/17	2/11/17	5/12/17	2/01/18	1/02/18	1/03/18	3/04/18	1/05/18	5/06/18	3/07/18	2/08/18	4/09/18	2/10/18	1/11/18	3/12/18
Comments								Dry				Dry	Dry	Dry	Dry	Dry	Dry	Dry						Dry	Dry
Flow									0.25	0	0								0.25	1	1.5	0.5	0		
pH Field									6.89	6.28	6.43								6.2	6.67	6.7	6.81	6.45		
EC Field	uS/cm								500	2910	2620								260	810	1030	990	3970		
Salinity	ppm								250	1460	1310								130	410	510	490	1980		
Acidity as CaCO3	mg/L								9	24	15								5	9	9	17	9		
NH3-N	mg/L																								
EC Lab	uS/cm								450	2780	2450								209	733	855	829	3820		
Mg	mg/L																								
pH Lab									7.2	6.7	6.8								6.4	7.3	7.1	6.9	7.3		
Sulphate	mg/L								23	150	130								<5	47	46	37	140		
TDS	mg/L								250	1400	1500								108	570	485	463	2200		
TSS	mg/L								2	10	4								29	3	5	<1	6		
Al	mg/L																								
As (Arsenic)	mg/L																								
Cr (Chromium)	mg/L																								
Cu (Copper)	mg/L																								
Pb (Lead)	mg/L																								
Ni (Nickel)	mg/L																								
Zn (Zinc)	mg/L																								
BENZENE	ug/L																								
TOLUENE	ug/L																								
ETHYLBENZENE	ug/L																								
XYLENE	ug/L																								
TOTAL BTEX	ug/L																								
TRH C6 - C9	ug/L																								
TRH C10 - C14	ug/L																								
TRH C15 - C28	ug/L																								
TRH C29 - C36	ug/L																								
TOTAL TPH	ug/L																								
Chloride, Cl	mg/L																								
Calcium, Ca	mg/L																								
Sodium, Na	mg/L																								
RA-226																									
RA-228																									
Acrylamides																									
Acrylic Acid																									
TRH Surrogate (o-terphenyl)																									

Month		Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Date		2/01/19	4/02/19	1/03/19	1/04/19	1/05/209	4/06/19	2/07/19	5/08/19	3/09/19	2/10/19	5/11/19	2/12/19	2/01/20	3/02/20	3/03/20	1/04/20	1/05/20	2/06/20	1/07/20	3/08/20	1/09/20	1/10/20	2/11/20	1/12/20
Comments		Dry	Dry	Dry	Dry	Dry	Dry	Dry					Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry					Dry
Flow									0	1.5	0	0									0.5	0.25	0	0	
pH Field									5.96	7.15	6.6	7.02									7.3	6.52	6.42	6.94	
EC Field	uS/cm								4370	930	3320	3640									1220	2560	3210	4340	
Salinity	ppm								2180	470	1660	1820									610	1280	1610	2170	
Acidity as CaCO3	mg/L								60	7	18	15									16	32	30	22	
NH3-N	mg/L																								
EC Lab	uS/cm								3550	824	3230	3390									1190	2370	3100	4240	
Mg	mg/L																								
pH Lab									6.4	7.4	7.1	7.4									7.5	6.7	6.7	7.2	
Sulphate	mg/L								220	52	160	150									28	140	170	157	
TDS	mg/L								2000	490	1800	1800									700	1200	1700	2200	
TSS	mg/L								14	2	2	5									4	5	4	5	
Al	mg/L																								
As (Arsenic)	mg/L																								
Cr (Chromium)	mg/L																								
Cu (Copper)	mg/L																								
Pb (Lead)	mg/L																								
Ni (Nickel)	mg/L																								
Zn (Zinc)	mg/L																								
BENZENE	ug/L																								
TOLUENE	ug/L																								
ETHYLBENZENE	ug/L																								
XYLENE	ug/L																								
TOTAL BTEX	ug/L																								
TRH C6 - C9	ug/L																								
TRH C10 - C14	ug/L																								
TRH C15 - C28	ug/L																								
TRH C29 - C36	ug/L																								
TOTAL TPH	ug/L																								
Chloride, Cl	mg/L																								
Calcium, Ca	mg/L																								
Sodium, Na	mg/L																								
RA-226																									
RA-228																									
Acrylamides																									
Acrylic Acid																									
TRH Surrogate (o-terphenyl)																									

Month		Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
Date		4/01/21	1/02/21	2/03/21	1/04/21	3/05/21	1/06/21	1/07/21	2/08/21	1/09/21	11/10/21	28/10/21	8/12/21	6/01/22	3/02/22	8/03/22	19/04/22	20/05/22	22/06/22	27/07/22	16/08/22	26/09/22	26/10/22	17/11/22	15/12/23
Comments		Dry	Dry	Dry	Dry	Dry	Dry						Dry	Dry	Dry	Dry	Dry	Dry	Dry			0	Dry	Dry	Dry
Flow								0	1	0.5	0	0								1	1				
pH Field								7.26	7.2	7.07	6.26	6.54								7.23	6.62				
EC Field	uS/cm							1050	920	1590	3940	3130								720	740				
Salinity	ppm							520	460	790	1970	1570								370	370				
Acidity as CaCO3	mg/L							12	4	15	56	38								12	13				
NH3-N	mg/L																								
EC Lab	uS/cm							885	827	1500	3450	3010								546	703				
Mg	mg/L																								
pH Lab								7.7	7.7	7.3	6.7	7								7.2	7.1				
Sulphate	mg/L							66	36	83	170	160								37	33				
TDS	mg/L							600	480	900	1900	1600								330	380				
TSS	mg/L							3	3	5	21	6								4	5				
Al	mg/L																								
As (Arsenic)	mg/L																								
Cr (Chromium)	mg/L																								
Cu (Copper)	mg/L																								
Pb (Lead)	mg/L																								
Ni (Nickel)	mg/L																								
Zn (Zinc)	mg/L																								
BENZENE	ug/L																								
TOLUENE	ug/L																								
ETHYLBENZENE	ug/L																								
XYLENE	ug/L																								
TOTAL BTEX	ug/L																								
TRH C6 - C9	ug/L																								
TRH C10 - C14	ug/L																								
TRH C15 - C28	ug/L																								
TRH C29 - C36	ug/L																								
TOTAL TPH	ug/L																								
Chloride, Cl	mg/L																								
Calcium, Ca	mg/L																								
Sodium, Na	mg/L																								
RA-226																									
RA-228																									
Acrylamides																									
Acrylic Acid																									
TRH Surrogate (o-terphenyl)																									

YALSW03 **Woddidup Creek flows___ semi regional___ ~3.0km x 2.0km catchment**

Month		Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18
Date								18/07/17	14/08/17	18/09/17	10/10/17	2/11/17	5/12/17	2/01/18	1/02/18	1/03/18	3/04/18	1/05/18	5/06/18
Comments								Dry				Dry	Dry	Dry	Dry	Dry	Dry	Dry	
Flow									1.5	0	0.25								0
pH Field									6.99	6.65	6.5								6.02
EC Field	uS/cm								590	980	1130								250
Salinity	ppm								300	490	560								120
Acidity as CaCO3	mg/L								10	15	14								7
NH3-N	mg/L																		
EC Lab	uS/cm								540	866	1020								208
Mg	mg/L																		
pH Lab									7.1	6.8	6.9								6.2
Sulphate	mg/L								35	50	65								9
TDS	mg/L								300	430	580								112
TSS	mg/L								6	8	31								375
Al	mg/L																		
As (Arsenic)	mg/L																		
Cr (Chromium)	mg/L																		
Cu (Copper)	mg/L																		
Pb (Lead)	mg/L																		
Ni (Nickel)	mg/L																		
Zn (Zinc)	mg/L																		
BENZENE	ug/L																		
TOLUENE	ug/L																		
ETHYLBENZENE	ug/L																		
XYLENE	ug/L																		
TOTAL BTEX	ug/L																		
TRH C6 - C9	ug/L																		
TRH C10 - C14	ug/L																		
TRH C15 - C28	ug/L																		
TRH C29 - C36	ug/L																		
TOTAL TPH	ug/L																		
Chloride, Cl	mg/L																		
Calcium, Ca	mg/L																		
Sodium, Na	mg/L																		
RA-226																			
RA-228																			
Acrylamides																			
Acrylic Acid																			
TRH Surrogate (o-terphenyl)																			

Month	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
Date	3/07/18	2/08/18	4/09/18	2/10/18	1/11/18	3/12/18	2/01/19	4/02/19	1/03/19	1/04/19	1/05/19	4/06/19	2/07/19	5/08/19	3/09/19	2/10/19	5/11/19	2/12/19
Comments					Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry				Dry	Dry	Dry
Flow	1.5	2	1	0									0.25	0.75	2			
pH Field	6.65	6.76	6.84	6.55									6.5	6.95	7.03			
EC Field	730	800	900	1010									1080	1020	730			
Salinity	370	400	450	500									540	510	360			
Acidity as CaCO3	9	8	15	4									5	5	6			
NH3-N																		
EC Lab	644	668	763	887									1010	844	649			
Mg																		
pH Lab	7.1	7	6.8	7.5									7.1	7.4	7			
Sulphate	47	42	48	55									81	51	46			
TDS	425	399	391	530									510	500	400			
TSS	7	5	<1	9									1	3	4			
Al																		
As (Arsenic)																		
Cr (Chromium)																		
Cu (Copper)																		
Pb (Lead)																		
Ni (Nickel)																		
Zn (Zinc)																		
BENZENE																		
TOLUENE																		
ETHYLBENZENE																		
XYLENE																		
TOTAL BTEX																		
TRH C6 - C9																		
TRH C10 - C14																		
TRH C15 - C28																		
TRH C29 - C36																		
TOTAL TPH																		
Chloride, Cl																		
Calcium, Ca																		
Sodium, Na																		
RA-226																		
RA-228																		
Acrylamides																		
Acrylic Acid																		
TRH Surrogate (o-terphenyl)																		

Month	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21
Date	2/01/20	3/02/20	3/03/20	1/04/20	1/05/20	2/06/20	1/07/20	3/08/20	1/09/20	1/10/20	2/11/20	1/12/20	4/01/21	1/02/21	2/03/21	1/04/21	3/05/21	1/06/21
Comments	Dry	Dry	Dry	Dry	Dry	Dry					Dry	Dry	Dry	Dry	Dry	Dry	Dry	
Flow							0.75	1.5	1	0.25								0
pH Field							7.14	7	6.96	6.7								6.65
EC Field							850	880	890	1000								670
Salinity							430	440	490	500								330
Acidity as CaCO3							8	12	9	12								7
NH3-N																		
EC Lab							827	837	813	973								596
Mg																		
pH Lab							7.3	7.1	7.1	7								6.8
Sulphate							48	36	47	55								47
TDS							500	470	390	560								380
TSS							4	10	10	5								14
Al																		
As (Arsenic)																		
Cr (Chromium)																		
Cu (Copper)																		
Pb (Lead)																		
Ni (Nickel)																		
Zn (Zinc)																		
BENZENE																		
TOLUENE																		
ETHYLBENZENE																		
XYLENE																		
TOTAL BTEX																		
TRH C6 - C9																		
TRH C10 - C14																		
TRH C15 - C28																		
TRH C29 - C36																		
TOTAL TPH																		
Chloride, Cl																		
Calcium, Ca																		
Sodium, Na																		
RA-226																		
RA-228																		
Acrylamides																		
Acrylic Acid																		
TRH Surrogate (o-terphenyl)																		

Month	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
Date	1/07/21	2/08/21	1/09/21	11/10/21	28/10/21	8/12/21	6/01/22	3/02/22	8/03/22	19/04/22	23/05/22	22/06/22	27/07/22	16/08/22	26/09/22	26/10/22	17/11/22	15/12/23
Comments						Dry	Dry	Dry	Dry	Dry	Dry	Dry				Dry	Dry	Dry
Flow	0.5	2.5	0.5	0.5	0.5								1	2	0	0	0	0
pH Field	6.8	6.68	6.96	6.73	7								7.26	6.62	7.1			
EC Field	930	790	1020	1050	1020								920	800	980			
Salinity	470	400	510	530	510								470	400	490			
Acidity as CaCO3	11	10	14	15	11								11	13	5			
NH3-N																		
EC Lab	820	700	939	983	926								727	713	841			
Mg																		
pH Lab	7.3	7.1	7.1	7.1	7.3								6.9	7.1	7.1			
Sulphate	47	33	49	49	39								50	41	81			
TDS	540	430	510	520	470								380	400	450			
TSS	7	7	7	25	4								9	10	6			
Al																		
As (Arsenic)																		
Cr (Chromium)																		
Cu (Copper)																		
Pb (Lead)																		
Ni (Nickel)																		
Zn (Zinc)																		
BENZENE																		
TOLUENE																		
ETHYLBENZENE																		
XYLENE																		
TOTAL BTEX																		
TRH C6 - C9																		
TRH C10 - C14																		
TRH C15 - C28																		
TRH C29 - C36																		
TOTAL TPH																		
Chloride, Cl																		
Calcium, Ca																		
Sodium, Na																		
RA-226																		
RA-228																		
Acrylamides																		
Acrylic Acid																		
TRH Surrogate (o-terphenyl)																		

YALSW04 **Ag dam Lot 758. Seepage from Bassendean Sands in close proximity to proposed mining**

Month		Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17
Date							27/06/17	18/07/17	14/08/17	18/09/17	10/10/17	2/11/17	5/12/17
Comments													
Flow							0	0	0	0	0	0	0
pH Field							6.7	6.7	6.99	6.86	6.72	6.94	6.92
EC Field	uS/cm						810	800	700	750	790	630	640
Salinity	ppm						410	400	350	370	390	320	320
ROP							52						
Acidity as CaCO3	mg/L						7	7	6	11	6	4	9
Alkalinity							50						
NH3-N	mg/L												
EC Lab	uS/cm						743	733	642	624	576	582	565
Mg	mg/L												
pH Lab							7.3	7.2	7.1	7.1	7.2	7.4	7.2
Sulphate	mg/L						77	80	78	76	66	61	65
TDS	mg/L						420	410	330	300	350	330	310
TSS	mg/L							4	12	5	4	4	8
Al	mg/L						0.052						
Al Total	mg/L						0.15						
As (Arsenic)	mg/L						0.0002						
Cadmium	mg/L						<0.0001						
Cr (Chromium)	mg/L						<0.0001						
Fe	mg/L						0.15						
Fe Total	mg/L						0.15						
Mn	mg/L						0.006						
Cu (Copper)	mg/L												
Pb (Lead)	mg/L												
Ni (Nickel)	mg/L						<0.0005						
Ammonia as NH3-N	mg/L						0.10						
Nitrogen Total	mg/L						2.9						
Dissolved Oxygen	mg/L						11						
Total Phosphorus	mg/L						0.010						
Selenium	mg/L						0.0003						
Zn (Zinc)	mg/L						0.003						
BENZENE	ug/L												
TOLUENE	ug/L												
ETHYLBENZENE	ug/L												
XYLENE	ug/L												
TOTAL BTEX	ug/L												
TRH C6 - C9	ug/L												
TRH C10 - C14	ug/L												
TRH C15 - C28	ug/L												
TRH C29 - C36	ug/L												
TOTAL TPH	ug/L												
Chloride, Cl	mg/L						150						
Calcium, Ca	mg/L												
Sodium, Na	mg/L												
RA-226													
RA-228													
Acrylamides													
Acrylic Acid													
TRH Surrogate (o-terphenyl)													

Month	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
Date	2/01/18	1/02/18	1/03/18	3/04/18	1/05/18	5/06/18	3/07/18	2/08/18	4/09/18	2/10/18	1/11/18	3/12/18
Flow	0	0	0	0	0	0	0	0	0	0	0	0
pH Field	6.8	7.15	6.82	6.7	6.83	6.87	6.82	6.86	6.95	6.65	6.67	6.78
EC Field	690	690	740	820	820	830	810	740	700	670	650	700
Salinity	340	340	370	410	410	410	410	370	350	340	330	350
Acidity as CaCO3	10	9	12	7	9	6	5	7	8	4	6	6
EC Lab	583	626	693	751	755	719	709	630	589	596	627	623
pH Lab	7.1	7.2	7	7.2	7.1	7.2	7.3	7.1	7	7.4	7.3	7.4
Sulphate	71	84	72	83	74	74	76	69	61	60	58	49
TDS	334	314	352	407	396	380	450	381	312	350	330	320
TSS	7	9	7	2	5	21	9	3	<1	11	3	7

Month	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
Date	2/01/19	4/02/19	5/03/19	1/04/19	1/05/19	4/06/19	2/07/19	5/08/19	3/09/19	2/10/19	5/11/19	2/12/19
Flow	0	0	0	0	0	0	0	0	0	0	0	0
pH Field	6.7	6.74	6.8	6.5	6.65	6.6	6.65	6.7	7.1	6.99	7.13	7.13
EC Field	730	780	850	930	840	820	850	870	790	860	830	910
Salinity	360	390	420	470	420	410	430	440	400	430	430	460
Acidity as CaCO3	6	7	5	15	8	9	4	5	3	3	4	7
EC Lab	662	693	750	781	804	786	781	752	715	724	723	751
pH Lab	7.3	7.2	7.3	6.8	7.1	7.1	7.1	7.3	7.4	7.7	7.6	7.3
Sulphate	49	74	82	83	75	77	85	79	74	68	61	65
TDS	370	340	390	410	400	420	400	430	380	390	360	400
TSS	7	7	8	8	2	<1	21	1	9	8	6	7

Month	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Date	2/01/20	3/02/20	3/03/20	1/04/20	11/05/20	2/06/20	1/07/20	3/08/20	1/09/20	1/10/20	2/11/20	1/12/20
Flow	0	0	0	0	0	0	0	0	0	0	0	0
pH Field	7.15	6.9	6.88	6.79	6.83	6.85	7.17	6.97	7.04	7.24	7.06	6.91
EC Field	810	880	870	880	860	840	850	790	760	740	780	760
Salinity	400	440	430	440	430	420	420	390	380	370	370	380
Acidity as CaCO3	8	8	7	9	5	7	4	9	5	3	8	6
EC Lab	776	827	834	844	865	832	826	785	731	717	746	763
pH Lab	7.2	7.2	7.3	7.1	7.3	7.3	7.5	7.1	7.5	7.8	7.3	7.5
Sulphate	74	79	79	83	86	85	86	78	77	73	59.2	61.1
TDS	420	420	430	510	460	450	430	380	380	420	430	440
TSS	6	5	3	2	6	7	5	6	7	6	4	6

Month	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
Date	4/01/21	1/02/21	2/03/21	14/04/21	3/05/21	1/06/21	1/07/21	2/08/21	1/09/21	11/10/21	28/10/21	8/12/21
Flow	0	0	0	0	0	0	0	0	0	0	0	0
pH Field	7.01	6.9	6.72	7.32	7.12	6.98	7.1	6.91	7.36	7.25	7.17	7.21
EC Field	860	970	1000	980	1010	940	970	880	830	810	820	960
Salinity	430	480	500	490	500	470	490	440	420	410	410	480
Acidity as CaCO3	9		8	7	7	5	5	6	5	5	4	6
EC Lab	944	911	952	916	943	896	904	793	764	755	749	855
pH Lab	7.2	7.2	7.2	7.2	7.3	7.4	7.5	7.3	7.4	7.5	7.4	7.6
Sulphate	77	89	91	90	89	84	85	77	70	64	64	65
TDS	430	480	520	540	500	470	480	410	410	380	400	430
TSS	14	9	6	2	5	6	5	5	5	6	5	8

Month	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
Date	3/02/22	22/02/22	8/03/22	12/04/22	12/05/22	22/06/22	27/07/22	30/08/22	26/09/22	26/10/22	22/11/22	15/12/23
Flow	0	0	0	0	0	0	0	0	0	0	0	0
pH Field	6.71	6.62	6.6	6.06	6.45	6.68	6.94	6.75	7.05	7.01	7.25	7.2
EC Field	1050	1090	1180	1200	1190	1010	1150	960	940	930	920	910
Salinity	520	550	590	600	610	500	590	470	460	460	460	450
Acidity as CaCO3	12	13	12	10	8	7	11	9	10		6	5
EC Lab	929	914	968	985	982	955	938	838	855	865	932	942
pH Lab	7.1	6.9	7	7.6	7.2	7	7	7.2	7.1	7.2	7.1	7.2
Sulphate	77	80	81	84	84	90	90	82	78	81	79	78
TDS	460	500	500	490	500	490	470	490	480	478	486	480
TSS	5	4	5	2	2	6	8	7	6	5	6	7

YALSW05 **Un-named Creek___ catchment estimated 2.0km x 2.0km**

Month		Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
Date								18/07/17	14/08/17	18/09/17	10/10/17	2/11/17	5/12/17	2/01/18	1/02/18	1/03/18	3/04/18	1/05/18	5/06/18	3/07/18	2/08/18	4/09/18	2/10/18	1/11/18	3/12/18
Comments										Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry					Dry	Dry	Dry
Flow								0	1.5										2	1.5	1.5	0.25			
pH Field								6.65	7.04										6.57	6.92	6.92	6.7			
EC Field	uS/cm							2560	490										560	910	990	1000			
Salinity	ppm							1280	250										280	460	500	500			
Acidity as CaCO3	mg/L							17	9										5	8	8	16			
NH3-N	mg/L																								
EC Lab	uS/cm							2460	449										488	798	833	845			
Mg	mg/L																								
pH Lab								6.9	7.2										6.6	7.3	7.1	6.8			
Sulphate	mg/L							270	22										39	57	51	42			
TDS	mg/L							1500	270										260	535	516	472			
TSS	mg/L							26	18										149	9	4	<1			
Al	mg/L																								
As (Arsenic)	mg/L																								
Cr (Chromium)	mg/L																								
Cu (Copper)	mg/L																								
Pb (Lead)	mg/L																								
Ni (Nickel)	mg/L																								
Zn (Zinc)	mg/L																								
BENZENE	ug/L																								
TOLUENE	ug/L																								
ETHYLBENZENE	ug/L																								
XYLENE	ug/L																								
TOTAL BTEX	ug/L																								
TRH C6 - C9	ug/L																								
TRH C10 - C14	ug/L																								
TRH C15 - C28	ug/L																								
TRH C29 - C36	ug/L																								
TOTAL TPH	ug/L																								
Chloride, Cl	mg/L																								
Calcium, Ca	mg/L																								
Sodium, Na	mg/L																								
RA-226																									
RA-228																									
Acrylamides																									
Acrylic Acid																									
TRH Surrogate (o-terphenyl)																									

Month		Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Date		2/01/19	4/02/19	1/03/19	1/04/19	1/05/19	4/06/19	2/07/19	5/08/19	3/09/19	2/10/19	5/11/19	2/12/19	2/01/20	3/02/20	3/03/20	1/04/20	1/05/20	2/06/20	1/07/20	3/08/20	1/09/20	1/10/20	2/11/20	1/12/20
Comments		Dry	Dry	Dry	Dry	Dry	Dry				Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry					Dry	Dry	Dry
Flow								0	0	1.5									0	0.25	1	0.25			
pH Field								6.7	6.82	6.88									6.83	7.05	7.02	7.06			
EC Field	uS/cm							2640	4950	780									1830	1330	1090	3680			
Salinity	ppm							1320	2470	390									910	660	550	1840			
Acidity as CaCO3	mg/L							7	17	8									16	14	10	12			
NH3-N	mg/L																								
EC Lab	uS/cm							2580	4860	693									2850	1280	1040	3540			
Mg	mg/L																								
pH Lab								7	7.3	7									6.9	7.1	7.1	7.3			
Sulphate	mg/L							220	360	45									260	100	62	350			
TDS	mg/L							1500	2700	430									1200	810	590	1900			
TSS	mg/L							6	6	6									7	7	6	34			
Al	mg/L																								
As (Arsenic)	mg/L																								
Cr (Chromium)	mg/L																								
Cu (Copper)	mg/L																								
Pb (Lead)	mg/L																								
Ni (Nickel)	mg/L																								
Zn (Zinc)	mg/L																								
BENZENE	ug/L																								
TOLUENE	ug/L																								
ETHYLBENZENE	ug/L																								
XYLENE	ug/L																								
TOTAL BTEX	ug/L																								
TRH C6 - C9	ug/L																								
TRH C10 - C14	ug/L																								
TRH C15 - C28	ug/L																								
TRH C29 - C36	ug/L																								
TOTAL TPH	ug/L																								
Chloride, Cl	mg/L																								
Calcium, Ca	mg/L																								
Sodium, Na	mg/L																								
RA-226																									
RA-228																									
Acrylamides																									
Acrylic Acid																									
TRH Surrogate (o-terphenyl)																									

Month		Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
Date		4/01/21	1/02/21	2/03/21	1/04/21	3/05/21	1/06/21	1/07/21	2/08/21	1/09/21	11/10/21	28/10/21	15/12/21	6/01/22	3/02/22	8/03/22	17/04/22	23/05/22	22/06/22	27/07/22	16/08/22	26/09/22	26/10/22	17/11/22	14/12/22
Comments		Dry	Dry	Dry	Dry	Dry							Dry	Dry	Dry	Dry	Dry	Dry	Dry				Dry	Dry	Dry
Flow							0	0	2.5	0.5	0	0								1	1	0			
pH Field							6.7	6.8	6.89	7	7.17	6.55								6.8	6.59				
EC Field	uS/cm						2120	2380	630	1970	4590	1330								1290	1050				
Salinity	ppm						1060	1190	320	980	2300	660								660	530				
Acidity as CaCO3	mg/L						16	22	7	15	12	10								17	13				
NH3-N	mg/L																								
EC Lab	uS/cm						1900	2440	566	1790	4260	1220								1060	980				
Mg	mg/L																								
pH Lab							7	7.4	7.3	7.2	7.6	6.8								6.9	7.2				
Sulphate	mg/L						140	140	16	83	340	85								73	57				
TDS	mg/L						1200	1400	350	1100	2300	590								580	530				
TSS	mg/L						8	14	2	7	65	11								9	4				
Al	mg/L																								
As (Arsenic)	mg/L																								
Cr (Chromium)	mg/L																								
Cu (Copper)	mg/L																								
Pb (Lead)	mg/L																								
Ni (Nickel)	mg/L																								
Zn (Zinc)	mg/L																								
BENZENE	ug/L																								
TOLUENE	ug/L																								
ETHYLBENZENE	ug/L																								
XYLENE	ug/L																								
TOTAL BTEX	ug/L																								
TRH C6 - C9	ug/L																								
TRH C10 - C14	ug/L																								
TRH C15 - C28	ug/L																								
TRH C29 - C36	ug/L																								
TOTAL TPH	ug/L																								
Chloride, Cl	mg/L																								
Calcium, Ca	mg/L																								
Sodium, Na	mg/L																								
RA-226																									
RA-228																									
Acrylamides																									
Acrylic Acid																									
TRH Surrogate (o-terphenyl)																									

YALSW06 Optional___ alternate site if YALSW02 access is poor

Month		Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
Date								18/07/17	14/08/17	18/09/17	10/10/17	2/11/17	5/12/17	2/01/18	1/02/18	1/03/18	3/04/18	1/05/18	5/06/18	3/07/18	2/08/18	4/09/18	2/10/18	1/11/18	3/12/18
Comments										Dry		Dry	Dry	Dry	Dry	Dry	Dry	Dry						Dry	Dry
Flow								0	1.5		0								1	1.5	1.5	0.75	0		
pH Field								6.35	7.01		6.87								6.62	6.89	6.96	6.9	6.85		
EC Field	uS/cm							2620	540		2820								180	880	1090	1910	2990		
Salinity	ppm							1310	270		1410								90	440	550	960	1500		
Acidity as CaCO3	mg/L							25	9		11								5	8	6	14	16		
NH3-N	mg/L																								
EC Lab	uS/cm							2600	498		2600								148	762	933	1700	2850		
Mg	mg/L																								
pH Lab								6.4	7.2		7.1								6.7	7.3	7.2	7	7.5		
Sulphate	mg/L							230	26		130								15	50	50	98	76		
TDS	mg/L							1500	260		1500								89	435	538	917	1600		
TSS	mg/L							14	4		16								201	7	6	<1	9		
Al	mg/L																								
As (Arsenic)	mg/L																								
Cr (Chromium)	mg/L																								
Cu (Copper)	mg/L																								
Pb (Lead)	mg/L																								
Ni (Nickel)	mg/L																								
Zn (Zinc)	mg/L																								
BENZENE	ug/L																								
TOLUENE	ug/L																								
ETHYLBENZENE	ug/L																								
XYLENE	ug/L																								
TOTAL BTEX	ug/L																								
TRH C6 - C9	ug/L																								
TRH C10 - C14	ug/L																								
TRH C15 - C28	ug/L																								
TRH C29 - C36	ug/L																								
TOTAL TPH	ug/L																								
Chloride, Cl	mg/L																								
Calcium, Ca	mg/L																								
Sodium, Na	mg/L																								
RA-226																									
RA-228																									
Acrylamides																									
Acrylic Acid																									
TRH Surrogate (o-terphenyl)																									

Month		Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Date		2/01/19	4/02/19	1/03/19	1/04/19	1/0/2019	4/06/19	2/07/19	5/08/19	3/09/19	2/10/19	5/11/19	2/12/19	2/01/20	3/02/20	3/03/20	1/04/20	1/05/20	2/06/20	1/07/20	3/08/20	1/09/20	1/10/20	2/11/20	1/12/20
Comments		Dry	Dry	Dry	Dry	Dry	Dry				Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry					Dry	Dry
Flow								0	0	1.5										0	0.5	0	0		
pH Field								6.44	7	7.15										6.35	7.3	6.95	7.12		
EC Field	uS/cm							1740	2320	890										1440	1370	2130	2130		
Salinity	ppm							870	1160	450										720	690	1070	1060		
Acidity as CaCO3	mg/L							17	16	6										100	14	13	20		
NH3-N	mg/L																								
EC Lab	uS/cm							1620	2100	789										1350	1370	2060	2050		
Mg	mg/L																								
pH Lab								6.6	7.4	7.4										6.4	7.5	7.2	7.4		
Sulphate	mg/L							210	96	49										140	41	110	15		
TDS	mg/L							960	1200	480										810	760	1100	1200		
TSS	mg/L							40	20	2										38	4	3	26		
Al	mg/L																								
As (Arsenic)	mg/L																								
Cr (Chromium)	mg/L																								
Cu (Copper)	mg/L																								
Pb (Lead)	mg/L																								
Ni (Nickel)	mg/L																								
Zn (Zinc)	mg/L																								
BENZENE	ug/L																								
TOLUENE	ug/L																								
ETHYLBENZENE	ug/L																								
XYLENE	ug/L																								
TOTAL BTEX	ug/L																								
TRH C6 - C9	ug/L																								
TRH C10 - C14	ug/L																								
TRH C15 - C28	ug/L																								
TRH C29 - C36	ug/L																								
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Chloride, Cl	mg/L																								
Calcium, Ca	mg/L																								
Sodium, Na	mg/L																								
RA-226																									
RA-228																									
Acrylamides																									
Acrylic Acid																									
TRH Surrogate (o-terphenyl)																									

Month		Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
Date		4/01/21	1/02/21	2/03/21	1/04/21	3/05/21	1/06/21	1/07/21	2/08/21	1/09/21	11/10/21	28/10/21	15/12/21	6/01/22	3/02/22	8/03/22	17/04/22	23/05/22	22/06/22	27/07/22	30/08/22	26/09/22	26/10/22	17/11/22	15/12/23
Comments		Dry	Dry	Dry	Dry	Dry							Dry	Dry	Dry	Dry	Dry	Dry	Dry				Dry	Dry	Dry
Flow							0	0	1.5	0.5	0	0								0.5					
pH Field							5.95	7.00	7.1	7.24	7.2	7.15								7.77					
EC Field	uS/cm						920	1510	940	2970	2120	2740								4010					
Salinity	ppm						460	750	470	1490	1060	1370								2040					
Acidity as CaCO3	mg/L						29	19	6	12	9	11								9					
NH3-N	mg/L																								
EC Lab	uS/cm						1080	1350	835	2790	1880	2610								840					
Mg	mg/L																								
pH Lab							6.2	7.5	7.5	7.6	7.6	7.4								7.2					
Sulphate	mg/L						270	110	40	150	120	120								49					
TDS	mg/L						690	900	490	1600	1000	1400								450					
TSS	mg/L						40	3	3	4	12	15								5					
Al	mg/L																								
As (Arsenic)	mg/L																								
Cr (Chromium)	mg/L																								
Cu (Copper)	mg/L																								
Pb (Lead)	mg/L																								
Ni (Nickel)	mg/L																								
Zn (Zinc)	mg/L																								
BENZENE	ug/L																								
TOLUENE	ug/L																								
ETHYLBENZENE	ug/L																								
XYLENE	ug/L																								
TOTAL BTEX	ug/L																								
TRH C6 - C9	ug/L																								
TRH C10 - C14	ug/L																								
TRH C15 - C28	ug/L																								
TRH C29 - C36	ug/L																								
TOTAL TPH	ug/L																								
Chloride, Cl	mg/L																								
Calcium, Ca	mg/L																								
Sodium, Na	mg/L																								
RA-226																									
RA-228																									
Acrylamides																									
Acrylic Acid																									
TRH Surrogate (o-terphenyl)																									

YALSW07 Farm dam___ anecdotally fed by unconfined Leederville bore flows

Month		Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17
Date							29/06/17	27/07/17	16/08/17	21/09/17	19/10/17	16/11/17	18/12/17
Comments													
Flow							0	0	0	0	0	0	0
pH Field							7.65	7.45	7.74	7.63	7.53	8.24	8.1
EC Field	uS/cm						4530	4160	3840	3840	3900	4040	4250
Salinity	ppm						2260	2080	1920	1920	1950	2020	2120
ROP							217						
Acidity as CaCO3	mg/L						1	7	9	11	3	3	4
Alkalinity							250						
NH3-N	mg/L												
EC Lab	uS/cm						4590	4100	3700	3690	3690	3970	3980
Mg	mg/L												
pH Lab							8.3	8	7.7	8.3	8.2	8.3	8.1
Sulphate	mg/L						450	350	330	320	320	350	390
TDS	mg/L						2700	2500	2000	2200	2200	2200	2140
TSS	mg/L							10	7	8	5	7	17
Al	mg/L						0.013						
Al Total							0.16						
As (Arsenic)	mg/L						0.0003						
Cadium							<0.0001						
Cr (Chromium)	mg/L						<0.0001						
Fe							0.046						
Fe Total							0.067						
Mn	mg/L						0.0031						
Pb (Lead)	mg/L												
Ni (Nickel)	mg/L						<0.0005						
Ammonia as NH3-N							0.01						
Total Nitrogen							1.1						
Dissolved Oxygen							11						
Phosphate as PO4-P							0.010						
Total Phosphus							0.033						
Selenium							<0.0002						
Zn (Zinc)	mg/L						<0.001						
BENZENE	ug/L												
TOLUENE	ug/L												
ETHYLBENZENE	ug/L												
XYLENE	ug/L												
TOTAL BTEX	ug/L												
TRH C6 - C9	ug/L												
TRH C10 - C14	ug/L												
TRH C15 - C28	ug/L												
TRH C29 - C36	ug/L												
TOTAL TPH	ug/L												
Chloride, Cl	mg/L						1200						
Calcium, Ca	mg/L												
Sodium, Na	mg/L												
RA-226													
RA-228													
Acrylamides													
Acrylic Acid													
TRH Surrogate (o-terphenyl)													

Month		Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
Date		17/01/18	15/02/18	15/03/18	18/04/18	14/05/18	14/06/18	11/07/18	13/08/18	12/09/18	10/10/18	12/11/18	11/12/18
Comments													
Flow		0	0	0	0	0	0	0	0	0	0	0	0
pH Field		8.3	8.2	8.5	7.98	7.98	7.55	7.76	7.8	8.12	8.14	8.1	8.18
EC Field	uS/cm	4540	4680	5030	5270	5220	4160	3850	3610	3700	3700	3820	3940
Salinity	ppm	2270	2340	2510	2630	2610	2080	1920	1810	1850	1850	1910	1970
ROP													
Acidity as CaCO3	mg/L	<1	4	<1	5	6	14	10	10	6	3	<2	<2
Alkalinity													
NH3-N	mg/L												
EC Lab	uS/cm	4190	4410	4900	5270	5150	4000	3630	3470	3430	3580	3720	3780
Mg	mg/L												
pH Lab		8.6	8.2	8.3	8.1	8.1	7.6	7.8	7.8	8	8.3	8.3	8.5
Sulphate	mg/L	470	490	440	450	430	350	330	310	320	310	250	340
TDS	mg/L	2570	2980	2570	3030	3190	2350	2220	2030	1820	2100	2200	2100
TSS	mg/L	22	5	10	6	8	7	5	5	8	5	5	6
Al	mg/L												
Al Total													
As (Arsenic)	mg/L												
Cadium													
Cr (Chromium)	mg/L												
Fe													
Fe Total													
Mn	mg/L												
Pb (Lead)	mg/L												
Ni (Nickel)	mg/L												
Ammonia as NH3-N													
Total Nitrogen													
Dissolved Oxygen													
Phosphate as PO4-P													
Total Phosphus													
Selenium													
Zn (Zinc)	mg/L												
BENZENE	ug/L												
TOLUENE	ug/L												
ETHYLBENZENE	ug/L												
XYLENE	ug/L												
TOTAL BTEX	ug/L												
TRH C6 - C9	ug/L												
TRH C10 - C14	ug/L												
TRH C15 - C28	ug/L												
TRH C29 - C36	ug/L												
TOTAL TPH	ug/L												
Chloride, Cl	mg/L												
Calcium, Ca	mg/L												
Sodium, Na	mg/L												
RA-226													
RA-228													
Acrylamides													
Acrylic Acid													
TRH Surrogate (o-terphenyl)													

Month		Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
Date		14/01/19	11/02/19	13/03/19	10/04/19	8/05/19	13/06/19	11/07/19	12/08/19	10/09/19	9/10/19	12/11/19	9/12/19
Comments													
Flow		0	0	0	0	0	0	0	0	0	0	0	0
pH Field		8.42	8.3	8.38	8.3	8.38	8.25	7.65	8	8	8.02	8.22	8.5
EC Field	uS/cm	4270	4560	4920	4940	4980	4610	3510	3440	3320	3450	3600	3660
Salinity	ppm	2130	2280	2460	2470	2490	2300	1750	1720	1660	1730	1800	1830
ROP													
Acidity as CaCO3	mg/L	<2	<2	<2	<2	<2	<2	9	4	3	<2	<2	<2
Alkalinity													
NH3-N	mg/L												
EC Lab	uS/cm	4120	4270	4690	4830	4870	4580	3390	3370	3190	3190	3330	3650
Mg	mg/L												
pH Lab		8.8	8.6	8.4	8.4	8.4	8.3	7.6	8.1	8.2	8.2	8.3	8.6
Sulphate	mg/L	380	460	470	450	450	430	310	300	270	290	300	330
TDS	mg/L	2600	2400	2800	2900	2600	2800	2200	1800	1700	1800	1900	2100
TSS	mg/L	10	8	9	9	6	13	6	6	8	6	5	3
Al	mg/L												
Al Total													
As (Arsenic)	mg/L												
Cadium													
Cr (Chromium)	mg/L												
Fe													
Fe Total													
Mn	mg/L												
Pb (Lead)	mg/L												
Ni (Nickel)	mg/L												
Ammonia as NH3-N													
Total Nitrogen													
Dissolved Oxygen													
Phosphate as PO4-P													
Total Phosphus													
Selenium													
Zn (Zinc)	mg/L												
BENZENE	ug/L												
TOLUENE	ug/L												
ETHYLBENZENE	ug/L												
XYLENE	ug/L												
TOTAL BTEX	ug/L												
TRH C6 - C9	ug/L												
TRH C10 - C14	ug/L												
TRH C15 - C28	ug/L												
TRH C29 - C36	ug/L												
TOTAL TPH	ug/L												
Chloride, Cl	mg/L												
Calcium, Ca	mg/L												
Sodium, Na	mg/L												
RA-226													
RA-228													
Acrylamides													
Acrylic Acid													
TRH Surrogate (o-terphenyl)													

Month		Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Date		9/01/20	10/02/20	10/03/20	1/04/20	11/05/20	10/06/20	10/07/20	7/08/20	10/09/20	14/10/20	10/11/20	9/12/20
Comments													
Flow		0	0	0	0	0	0	0	0	0	0	0	0
pH Field		8.8	8.5	8.8	8.85	8.1	8	7.88	7.94	7.81	8.08	8.4	8.2
EC Field	uS/cm	4000	4310	4610	4620	4390	4230	3650	3140	3080	3200	3140	3320
Salinity	ppm	2000	2150	2300	2310	2190	2120	1820	1570	1540	1600	1570	1660
ROP													
Acidity as CaCO3	mg/L	<2	<2	<2	<2	<2	6	9	9	5	<2	<2	<2
Alkalinity													
NH3-N	mg/L												
EC Lab	uS/cm	3890	4290	4540	4580	4500	4190	3600	3140	3050	3070	3130	3250
Mg	mg/L												
pH Lab		8.9	9.1	9.1	8.7	8.3	8	7.8	8	8	8.5	8.8	8.5
Sulphate	mg/L	390	420	440	440	410	390	320	290	260	310	310	330
TDS	mg/L	2300	2600	2700	2700	2700	2600	2100	1800	1770	1800	1900	2000
TSS	mg/L	8	14	15	26	9	6	5	8	3	2	2	3
Al	mg/L												
Al Total													
As (Arsenic)	mg/L												
Cadium													
Cr (Chromium)	mg/L												
Fe													
Fe Total													
Mn	mg/L												
Pb (Lead)	mg/L												
Ni (Nickel)	mg/L												
Ammonia as NH3-N													
Total Nitrogen													
Dissolved Oxygen													
Phosphate as PO4-P													
Total Phosphus													
Selenium													
Zn (Zinc)	mg/L												
BENZENE	ug/L												
TOLUENE	ug/L												
ETHYLBENZENE	ug/L												
XYLENE	ug/L												
TOTAL BTEX	ug/L												
TRH C6 - C9	ug/L												
TRH C10 - C14	ug/L												
TRH C15 - C28	ug/L												
TRH C29 - C36	ug/L												
TOTAL TPH	ug/L												
Chloride, Cl	mg/L												
Calcium, Ca	mg/L												
Sodium, Na	mg/L												
RA-226													
RA-228													
Acrylamides													
Acrylic Acid													
TRH Surrogate (o-terphenyl)													

Month		Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
Date		15/01/21	10/02/21	2/03/21	14/04/21	12/05/21	9/06/21	8/07/21	10/08/21	6/09/21	14/10/21	11/11/21	14/12/21
Comments													
Flow		0	0	0	0	0	0	0	0	0	0	0	0
pH Field		8.25	8.08	7.9	8.29	7.85	7.8	7.61	7.74	7.78	7.88	8.21	8.46
EC Field	uS/cm	3920	4090	4220	4080	4100	3940	3520	3240	3330	3340	3550	3840
Salinity	ppm	1960	2040	2110	2040	2050	1970	1760	1620	1670	1670	1770	1920
ROP													
Acidity as CaCO3	mg/L	2	<2	<2	<2	<2	7	11	4	6	3	<2	<2
Alkalinity													
NH3-N	mg/L												
EC Lab	uS/cm	3820	3970	4120	4260	3980	3840	3360	3120	3190	3190	3400	3670
Mg	mg/L												
pH Lab		8.3	8.3	8.5	8.4	7.8	7.7	7.8	8.4	8.3	7.9	8.4	8.5
Sulphate	mg/L	360	370	390	390	370	340	300	270	280	280	290	320
TDS	mg/L	2200	2300	2400	2700	2200	2300	2200	1800	2000	1700	1800	1900
TSS	mg/L	7	7	12	6	5	4	9	6	3	3	5	5
Al	mg/L												
Al Total													
As (Arsenic)	mg/L												
Cadium													
Cr (Chromium)	mg/L												
Fe													
Fe Total													
Mn	mg/L												
Pb (Lead)	mg/L												
Ni (Nickel)	mg/L												
Ammonia as NH3-N													
Total Nitrogen													
Dissolved Oxygen													
Phosphate as PO4-P													
Total Phosphus													
Selenium													
Zn (Zinc)	mg/L												
BENZENE	ug/L												
TOLUENE	ug/L												
ETHYLBENZENE	ug/L												
XYLENE	ug/L												
TOTAL BTEX	ug/L												
TRH C6 - C9	ug/L												
TRH C10 - C14	ug/L												
TRH C15 - C28	ug/L												
TRH C29 - C36	ug/L												
TOTAL TPH	ug/L												
Chloride, Cl	mg/L												
Calcium, Ca	mg/L												
Sodium, Na	mg/L												
RA-226													
RA-228													
Acrylamides													
Acrylic Acid													
TRH Surrogate (o-terphenyl)													

Month		Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
Date		6/01/21	3/02/22	8/03/22	19/04/22	17/05/22	23/06/22	20/07/22	25/08/22	28/09/22	26/10/22	17/11/22	14/12/22
Comments													
Flow		0	0	0	0	0	0	0	0	0	0	0	0
pH Field		8.46	8.55	8.4	7.46	7.93	7.91	7.77	707	7.5	7.82	7.72	7.62
EC Field	uS/cm	4170	4590	5150	4110	5700	4240	4010	3330	3350	3430	3460	3330
Salinity	ppm	2080	2290	2580	2060	2590	2130	2040	1670	1670	1700	1730	1660
ROP													
Acidity as CaCO3	mg/L	<2	<2	<2	<2	<2	<2	5	8	8	<2	<2	<2
Alkalinity											200		
NH3-N	mg/L												
EC Lab	uS/cm	4010	4490	4760	4980	4870	4250	3820	3250	3230	3180	3260	3600
Mg	mg/L												
pH Lab		8.5	8.7	8.6	8.3	8.4	8.2	8	7.8	8.1	8.2	8.1	8.3
Sulphate	mg/L	370	410	450	460	450	390	340	290	280	300	310	320
TDS	mg/L	2200	2300	2500	2700	2600	2300	2000	1700	1900	1900	2100	1900
TSS	mg/L	29	12	15	12	20	17	13	12	6	6	7	9
Al	mg/L												
Al Total													
As (Arsenic)	mg/L												
Cadium													
Cr (Chromium)	mg/L												
Fe													
Fe Total													
Mn	mg/L												
Pb (Lead)	mg/L												
Ni (Nickel)	mg/L												
Ammonia as NH3-N													
Total Nitrogen													
Dissolved Oxygen													
Phosphate as PO4-P													
Total Phosphus													
Selenium													
Zn (Zinc)	mg/L												
BENZENE	ug/L												
TOLUENE	ug/L												
ETHYLBENZENE	ug/L												
XYLENE	ug/L												
TOTAL BTEX	ug/L												
TRH C6 - C9	ug/L												
TRH C10 - C14	ug/L												
TRH C15 - C28	ug/L												
TRH C29 - C36	ug/L												
TOTAL TPH	ug/L												
Chloride, Cl	mg/L												
Calcium, Ca	mg/L												
Sodium, Na	mg/L												
RA-226													
RA-228													
Acrylamides													
Acrylic Acid													
TRH Surrogate (o-terphenyl)													

YALSW08 **Optional___ alternate site if YALSW02+06 access is poor**

Month		Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17
Date								18/07/17	14/08/17	18/09/17	10/10/17	2/11/17	5/12/17
Comments													Dry
Flow								0	1	0	0	0	
pH Field								6.71	7.08	6.76	6.84	7.1	
EC Field	uS/cm							1400	520	2260	2330	2140	
Salinity	ppm							700	260	1130	1160	1070	
Acidity as CaCO3	mg/L							11	9	14	7	3	
NH3-N	mg/L												
EC Lab	uS/cm							1400	482	2130	2120	2050	
Mg	mg/L												
pH Lab								7	7.3	7.1	7.3	7.9	
Sulphate	mg/L							100	28	150	160	120	
TDS	mg/L							740	270	1100	1200	1100	
TSS	mg/L							2	2	3	3	10	
Al	mg/L												
As (Arsenic)	mg/L												
Cr (Chromium)	mg/L												
Cu (Copper)	mg/L												
Pb (Lead)	mg/L												
Ni (Nickel)	mg/L												
Zn (Zinc)	mg/L												
BENZENE	ug/L												
TOLUENE	ug/L												
ETHYLBENZENE	ug/L												
XYLENE	ug/L												
TOTAL BTEX	ug/L												
TRH C6 - C9	ug/L												
TRH C10 - C14	ug/L												
TRH C15 - C28	ug/L												
TRH C29 - C36	ug/L												
TOTAL TPH	ug/L												
Chloride, Cl	mg/L												
Calcium, Ca	mg/L												
Sodium, Na	mg/L												
RA-226													
RA-228													
Acrylamides													
Acrylic Acid													
TRH Surrogate (o-terphenyl)													

Month		Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
Date		2/01/18	1/02/18	1/03/18	3/04/18	1/05/18	5/06/18	3/07/18	2/08/18	4/09/18	2/10/18	1/11/18	3/12/18
Comments		Dry	Dry	Dry	Dry	Dry						Dry	Dry
Flow							1	1.5	1.5	0.75	0		
pH Field							6.72	6.94	7.03	6.9	6.8		
EC Field	uS/cm						140	850	1050	1730	2180		
Salinity	ppm						70	420	530	870	1090		
Acidity as CaCO3	mg/L						4	9	7	15	5		
NH3-N	mg/L												
EC Lab	uS/cm						115	742	880	1520	2040		
Mg	mg/L												
pH Lab							6.9	7.3	7.2	7	7.6		
Sulphate	mg/L						7	50	48	97	140		
TDS	mg/L						58	450	512	802	1200		
TSS	mg/L						53	4	4	<1	2		
Al	mg/L												
As (Arsenic)	mg/L												
Cr (Chromium)	mg/L												
Cu (Copper)	mg/L												
Pb (Lead)	mg/L												
Ni (Nickel)	mg/L												
Zn (Zinc)	mg/L												
BENZENE	ug/L												
TOLUENE	ug/L												
ETHYLBENZENE	ug/L												
XYLENE	ug/L												
TOTAL BTEX	ug/L												
TRH C6 - C9	ug/L												
TRH C10 - C14	ug/L												
TRH C15 - C28	ug/L												
TRH C29 - C36	ug/L												
TOTAL TPH	ug/L												
Chloride, Cl	mg/L												
Calcium, Ca	mg/L												
Sodium, Na	mg/L												
RA-226													
RA-228													
Acrylamides													
Acrylic Acid													
TRH Surrogate (o-terphenyl)													

Month		Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
Date		2/01/19	4/02/19	1/03/19	1/04/19	1/05/19	4/06/19	2/07/19	5/08/19	3/09/19	2/10/19	5/11/19	2/12/19
Comments		Dry	Dry	Dry	Dry	Dry	Dry						Dry
Flow								0	0	1.5	0	0	
pH Field								6.77	6.97	7.14	7.03	7.02	
EC Field	uS/cm							770	2550	830	2240	1920	
Salinity	ppm							380	1270	410	1120	960	
Acidity as CaCO3	mg/L							4	7	6	6	7	
NH3-N	mg/L												
EC Lab	uS/cm							673	2350	739	2060	1710	
Mg	mg/L												
pH Lab								7	7.4	7.4	7.6	7.6	
Sulphate	mg/L							90	150	46	85	77	
TDS	mg/L							370	1400	450	1100	900	
TSS	mg/L							8	4	41	4	26	
Al	mg/L												
As (Arsenic)	mg/L												
Cr (Chromium)	mg/L												
Cu (Copper)	mg/L												
Pb (Lead)	mg/L												
Ni (Nickel)	mg/L												
Zn (Zinc)	mg/L												
BENZENE	ug/L												
TOLUENE	ug/L												
ETHYLBENZENE	ug/L												
XYLENE	ug/L												
TOTAL BTEX	ug/L												
TRH C6 - C9	ug/L												
TRH C10 - C14	ug/L												
TRH C15 - C28	ug/L												
TRH C29 - C36	ug/L												
TOTAL TPH	ug/L												
Chloride, Cl	mg/L												
Calcium, Ca	mg/L												
Sodium, Na	mg/L												
RA-226													
RA-228													
Acrylamides													
Acrylic Acid													
TRH Surrogate (o-terphenyl)													

Month		Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Date		2/01/20	3/02/20	3/03/20	1/04/20	1/05/20	2/06/20	1/07/20	3/08/20	1/09/20	1/10/20	2/11/20	1/12/20
Comments		Dry	Dry	Dry	Dry	Dry	Dry						Dry
Flow								0	0.5	0	0	0	
pH Field								7.02	7.34	7.02	7.3	7.35	
EC Field	uS/cm							370	1550	2230	2170	1840	
Salinity	ppm							190	770	1110	1080	920	
Acidity as CaCO3	mg/L							8	13	11	6	7	
NH3-N	mg/L												
EC Lab	uS/cm							373	1500	2160	2080	1780	
Mg	mg/L												
pH Lab								7	7.5	7.3	7.6	7.6	
Sulphate	mg/L							48	64	140	110	67.4	
TDS	mg/L							220	830	1200	1200	990	
TSS	mg/L							14	<2	6	5	24	
Al	mg/L												
As (Arsenic)	mg/L												
Cr (Chromium)	mg/L												
Cu (Copper)	mg/L												
Pb (Lead)	mg/L												
Ni (Nickel)	mg/L												
Zn (Zinc)	mg/L												
BENZENE	ug/L												
TOLUENE	ug/L												
ETHYLBENZENE	ug/L												
XYLENE	ug/L												
TOTAL BTEX	ug/L												
TRH C6 - C9	ug/L												
TRH C10 - C14	ug/L												
TRH C15 - C28	ug/L												
TRH C29 - C36	ug/L												
TOTAL TPH	ug/L												
Chloride, Cl	mg/L												
Calcium, Ca	mg/L												
Sodium, Na	mg/L												
RA-226													
RA-228													
Acrylamides													
Acrylic Acid													
TRH Surrogate (o-terphenyl)													

Month		Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
Date		4/01/21	1/02/21	2/03/21	1/04/21	3/05/21	1/06/21	1/07/21	3/08/21	1/09/21	11/10/21	28/10/21	15/12/21
Comments		Dry	Dry	Dry	Dry	Dry							Dry
Flow							0	0	1	0.5	0.5	0	
pH Field							6.6	7.00	7.11	7.1	7.07	7.11	
EC Field	uS/cm						210	1280	1120	2730	2530	2280	
Salinity	ppm						110	640	560	1370	1260	1140	
Acidity as CaCO3	mg/L						6	15	9	12	10	8	
NH3-N	mg/L												
EC Lab	uS/cm						190	1160	1000	2550	2280	2150	
Mg	mg/L												
pH Lab							6.9	7.5	7.2	7.4	7.5	7.5	
Sulphate	mg/L						19	85	52	160	160	120	
TDS	mg/L						120	700	550	1600	1200	1100	
TSS	mg/L						7	11	4	12	18	3	
Al	mg/L												
As (Arsenic)	mg/L												
Cr (Chromium)	mg/L												
Cu (Copper)	mg/L												
Pb (Lead)	mg/L												
Ni (Nickel)	mg/L												
Zn (Zinc)	mg/L												
BENZENE	ug/L												
TOLUENE	ug/L												
ETHYLBENZENE	ug/L												
XYLENE	ug/L												
TOTAL BTEX	ug/L												
TRH C6 - C9	ug/L												
TRH C10 - C14	ug/L												
TRH C15 - C28	ug/L												
TRH C29 - C36	ug/L												
TOTAL TPH	ug/L												
Chloride, Cl	mg/L												
Calcium, Ca	mg/L												
Sodium, Na	mg/L												
RA-226													
RA-228													
Acrylamides													
Acrylic Acid													
TRH Surrogate (o-terphenyl)													

Month		Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
Date		6/01/22	3/02/22	8/03/22	17/04/22	23/05/22	22/06/22	27/07/22	30/08/22	29/09/22	26/10/22	17/11/22	15/12/23
Comments		Dry	Dry	Dry	Dry	Dry	Dry		0	0	Dry	Dry	Dry
Flow								0.5					
pH Field								6.92					
EC Field	uS/cm							990					
Salinity	ppm							500					
Acidity as CaCO3	mg/L							12					
NH3-N	mg/L												
EC Lab	uS/cm							797					
Mg	mg/L												
pH Lab								7					
Sulphate	mg/L							58					
TDS	mg/L							450					
TSS	mg/L							4					
Al	mg/L												
As (Arsenic)	mg/L												
Cr (Chromium)	mg/L												
Cu (Copper)	mg/L												
Pb (Lead)	mg/L												
Ni (Nickel)	mg/L												
Zn (Zinc)	mg/L												
BENZENE	ug/L												
TOLUENE	ug/L												
ETHYLBENZENE	ug/L												
XYLENE	ug/L												
TOTAL BTEX	ug/L												
TRH C6 - C9	ug/L												
TRH C10 - C14	ug/L												
TRH C15 - C28	ug/L												
TRH C29 - C36	ug/L												
TOTAL TPH	ug/L												
Chloride, Cl	mg/L												
Calcium, Ca	mg/L												
Sodium, Na	mg/L												
RA-226													
RA-228													
Acrylamides													
Acrylic Acid													
TRH Surrogate (o-terphenyl)													

Month		Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23
Date										
Comments										
Flow										
pH Field										
EC Field	uS/cm									
Salinity	ppm									
Acidity as CaCO3	mg/L									
NH3-N	mg/L									
EC Lab	uS/cm									
Mg	mg/L									
pH Lab										
Sulphate	mg/L									
TDS	mg/L									
TSS	mg/L									
Al	mg/L									
As (Arsenic)	mg/L									
Cr (Chromium)	mg/L									
Cu (Copper)	mg/L									
Pb (Lead)	mg/L									
Ni (Nickel)	mg/L									
Zn (Zinc)	mg/L									
BENZENE	ug/L									
TOLUENE	ug/L									
ETHYLBENZENE	ug/L									
XYLENE	ug/L									
TOTAL BTEX	ug/L									
TRH C6 - C9	ug/L									
TRH C10 - C14	ug/L									
TRH C15 - C28	ug/L									
TRH C29 - C36	ug/L									
TOTAL TPH	ug/L									
Chloride, Cl	mg/L									
Calcium, Ca	mg/L									
Sodium, Na	mg/L									
RA-226										
RA-228										
Acrylamides										
Acrylic Acid										
TRH Surrogate (o-terphenyl)										

YALSW09 Un-named Creek/Artificial drains in centre of project

Month		Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17
Date								18/07/17	14/08/17		10/10/17	2/11/17	5/12/17
Comments								No Access	No Access	No Access	No Access	No Access	No Access
Flow													
pH Field													
EC Field	uS/cm												
Salinity	ppm												
Acidity as CaCO3	mg/L												
NH3-N	mg/L												
EC Lab	uS/cm												
Mg	mg/L												
pH Lab													
Sulphate	mg/L												
TDS	mg/L												
TSS	mg/L												
Al	mg/L												
As (Arsenic)	mg/L												
Cr (Chromium)	mg/L												
Cu (Copper)	mg/L												
Pb (Lead)	mg/L												
Ni (Nickel)	mg/L												
Zn (Zinc)	mg/L												
BENZENE	ug/L												
TOLUENE	ug/L												
ETHYLBENZENE	ug/L												
XYLENE	ug/L												
TOTAL BTEX	ug/L												
TRH C6 - C9	ug/L												
TRH C10 - C14	ug/L												
TRH C15 - C28	ug/L												
TRH C29 - C36	ug/L												
TOTAL TPH	ug/L												
Chloride, Cl	mg/L												
Calcium, Ca	mg/L												
Sodium, Na	mg/L												
RA-226													
RA-228													
Acrylamides													
Acrylic Acid													
TRH Surrogate (o-terphenyl)													

Month		Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
Date		2/01/18	1/02/18	1/03/18	3/04/18	1/05/18	5/06/18	3/07/18	2/08/18	4/09/18	2/09/18	1/11/18	3/12/18
Comments		No Access	No Access	No Access	No Access	No Access	No Access	No Access	No Access	No Access	No Access	No Access	No Access
Flow													
pH Field													
EC Field	uS/cm												
Salinity	ppm												
Acidity as CaCO3	mg/L												
NH3-N	mg/L												
EC Lab	uS/cm												
Mg	mg/L												
pH Lab													
Sulphate	mg/L												
TDS	mg/L												
TSS	mg/L												
Al	mg/L												
As (Arsenic)	mg/L												
Cr (Chromium)	mg/L												
Cu (Copper)	mg/L												
Pb (Lead)	mg/L												
Ni (Nickel)	mg/L												
Zn (Zinc)	mg/L												
BENZENE	ug/L												
TOLUENE	ug/L												
ETHYLBENZENE	ug/L												
XYLENE	ug/L												
TOTAL BTEX	ug/L												
TRH C6 - C9	ug/L												
TRH C10 - C14	ug/L												
TRH C15 - C28	ug/L												
TRH C29 - C36	ug/L												
TOTAL TPH	ug/L												
Chloride, Cl	mg/L												
Calcium, Ca	mg/L												
Sodium, Na	mg/L												
RA-226													
RA-228													
Acrylamides													
Acrylic Acid													
TRH Surrogate (o-terphenyl)													

Month		Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
Date		2/01/19	4/02/19	1/03/19	1/04/19	1/05/19	4/06/19	2/07/19	5/08/19	3/09/19	21/10/19	11/11/19	12/12/19
Comments		No Access	No Access	No Access	No Access	No Access	No Access	No Access	No Access	No Access	Dry	Dry	Dry
Flow													
pH Field													
EC Field	uS/cm												
Salinity	ppm												
Acidity as CaCO3	mg/L												
NH3-N	mg/L												
EC Lab	uS/cm												
Mg	mg/L												
pH Lab													
Sulphate	mg/L												
TDS	mg/L												
TSS	mg/L												
Al	mg/L												
As (Arsenic)	mg/L												
Cr (Chromium)	mg/L												
Cu (Copper)	mg/L												
Pb (Lead)	mg/L												
Ni (Nickel)	mg/L												
Zn (Zinc)	mg/L												
BENZENE	ug/L												
TOLUENE	ug/L												
ETHYLBENZENE	ug/L												
XYLENE	ug/L												
TOTAL BTEX	ug/L												
TRH C6 - C9	ug/L												
TRH C10 - C14	ug/L												
TRH C15 - C28	ug/L												
TRH C29 - C36	ug/L												
TOTAL TPH	ug/L												
Chloride, Cl	mg/L												
Calcium, Ca	mg/L												
Sodium, Na	mg/L												
RA-226													
RA-228													
Acrylamides													
Acrylic Acid													
TRH Surrogate (o-terphenyl)													

Month		Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Date		13/01/20	11/02/20	12/03/20	9/04/20	12/05/20	9/06/20	9/07/20	10/08/20	9/09/20	13/10/20	9/11/20	8/12/20
Comments		Dry	Dry	Dry	Dry	Dry							Dry
Flow							0	0			0	0	
pH Field							7.03	6.54			6.67	6.45	
EC Field	uS/cm						2580	1300			1500	2550	
Salinity	ppm						1290	650			750	1270	
Acidity as CaCO3	mg/L						20	19			14	16	
NH3-N	mg/L												
EC Lab	uS/cm						2470	1330			1400	2260	
Mg	mg/L												
pH Lab							7.2	6.6			7.1	6.4	
Sulphate	mg/L						120	120			<1	321	
TDS	mg/L						1500	670			820	1400	
TSS	mg/L						45	7			6	100	
Al	mg/L												
As (Arsenic)	mg/L												
Cr (Chromium)	mg/L												
Cu (Copper)	mg/L												
Pb (Lead)	mg/L												
Ni (Nickel)	mg/L												
Zn (Zinc)	mg/L												
BENZENE	ug/L												
TOLUENE	ug/L												
ETHYLBENZENE	ug/L												
XYLENE	ug/L												
TOTAL BTEX	ug/L												
TRH C6 - C9	ug/L												
TRH C10 - C14	ug/L												
TRH C15 - C28	ug/L												
TRH C29 - C36	ug/L												
TOTAL TPH	ug/L												
Chloride, Cl	mg/L												
Calcium, Ca	mg/L												
Sodium, Na	mg/L												
RA-226													
RA-228													
Acrylamides													
Acrylic Acid													
TRH Surrogate (o-terphenyl)													

Month		Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
Date		13/01/21	8/02/21	2/03/21	1/04/21	10/05/21	8/06/21	7/07/21	9/08/21	6/09/21	18/10/21	9/11/21	21/12/21
Comments		Dry	Dry	Dry	Dry			no access	no access	no access			DRY
Flow						0	0				0	0	
pH Field						7.1	6.75				6.83	6.91	
EC Field	uS/cm					3830	4010				1440	1690	
Salinity	ppm					1910	2000				720	850	
Acidity as CaCO3	mg/L					20	27					23	
NH3-N	mg/L												
EC Lab	uS/cm					3780	4050				1300	1570	
Mg	mg/L												
pH Lab						7.1	7				7.2	7.2	
Sulphate	mg/L					250	250				74	66	
TDS	mg/L					1900	2400				650	760	
TSS	mg/L					45	12				3	41	
Al	mg/L												
As (Arsenic)	mg/L												
Cr (Chromium)	mg/L												
Cu (Copper)	mg/L												
Pb (Lead)	mg/L												
Ni (Nickel)	mg/L												
Zn (Zinc)	mg/L												
BENZENE	ug/L												
TOLUENE	ug/L												
ETHYLBENZENE	ug/L												
XYLENE	ug/L												
TOTAL BTEX	ug/L												
TRH C6 - C9	ug/L												
TRH C10 - C14	ug/L												
TRH C15 - C28	ug/L												
TRH C29 - C36	ug/L												
TOTAL TPH	ug/L												
Chloride, Cl	mg/L												
Calcium, Ca	mg/L												
Sodium, Na	mg/L												
RA-226													
RA-228													
Acrylamides													
Acrylic Acid													
TRH Surrogate (o-terphenyl)													

Month		Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22
Date		6/01/22	3/02/22	8/03/22	17/04/22	23/05/22	22/06/22	27/07/22	11/08/22	26/09/22	26/10/22	17/11/22
Comments		Dry	Dry	Dry	Dry	Dry	Dry	no access	Flowimg	0	Dry	Dry
Flow									1			
pH Field									6.99			
EC Field	uS/cm								780			
Salinity	ppm								390			
Acidity as CaCO3	mg/L								11			
NH3-N	mg/L											
EC Lab	uS/cm								719			
Mg	mg/L											
pH Lab									7.2			
Sulphate	mg/L								47			
TDS	mg/L								420			
TSS	mg/L								14			
Al	mg/L											
As (Arsenic)	mg/L											
Cr (Chromium)	mg/L											
Cu (Copper)	mg/L											
Pb (Lead)	mg/L											
Ni (Nickel)	mg/L											
Zn (Zinc)	mg/L											
BENZENE	ug/L											
TOLUENE	ug/L											
ETHYLBENZENE	ug/L											
XYLENE	ug/L											
TOTAL BTEX	ug/L											
TRH C6 - C9	ug/L											
TRH C10 - C14	ug/L											
TRH C15 - C28	ug/L											
TRH C29 - C36	ug/L											
TOTAL TPH	ug/L											
Chloride, Cl	mg/L											
Calcium, Ca	mg/L											
Sodium, Na	mg/L											
RA-226												
RA-228												
Acrylamides												
Acrylic Acid												
TRH Surrogate (o-terphenyl)												

YALSW10 Downslope sampling site for western margins of project.

Month		Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17
Date								18/07/17	14/08/17	18/09/17	10/10/17	2/11/17	5/12/17
Comments								Dry				Dry	Dry
Flow									0.5	0	0		
pH Field									7.1	6.86	7.22		
EC Field	uS/cm								570	2710	2740		
Salinity	ppm								290	1360	1370		
Acidity as CaCO3	mg/L								10	18	6		
NH3-N	mg/L												
EC Lab	uS/cm								528	2580	2500		
Mg	mg/L												
pH Lab									7.3	7.1	7.5		
Sulphate	mg/L								28	120	130		
TDS	mg/L								270	1300	1400		
TSS	mg/L								3	14	5		
Al	mg/L												
As (Arsenic)	mg/L												
Cr (Chromium)	mg/L												
Cu (Copper)	mg/L												
Pb (Lead)	mg/L												
Ni (Nickel)	mg/L												
Zn (Zinc)	mg/L												
BENZENE	ug/L												
TOLUENE	ug/L												
ETHYLBENZENE	ug/L												
XYLENE	ug/L												
TOTAL BTEX	ug/L												
TRH C6 - C9	ug/L												
TRH C10 - C14	ug/L												
TRH C15 - C28	ug/L												
TRH C29 - C36	ug/L												
TOTAL TPH	ug/L												
Chloride, Cl	mg/L												
Calcium, Ca	mg/L												
Sodium, Na	mg/L												
RA-226													
RA-228													
Acrylamides													
Acrylic Acid													
TRH Surrogate (o-terphenyl)													

Month		Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
Date		2/01/18	1/02/18	1/03/18	3/04/18	1/05/18	5/06/18	3/07/18	2/08/18	4/09/18	2/10/18	1/11/18	3/12/18
Comments		Dry	Dry	Dry	Dry	Dry						Dry	Dry
Flow							0	1	1	0.25	0		
pH Field							6.3	6.98	7.05	6.9	6.85		
EC Field	uS/cm						100	840	1080	1890	2460		
Salinity	ppm						50	420	540	940	1230		
Acidity as CaCO3	mg/L						6	8	7	12	9		
NH3-N	mg/L												
EC Lab	uS/cm						76	730	913	1680	2340		
Mg	mg/L												
pH Lab							6.4	7.3	7.3	7.1	7.6		
Sulphate	mg/L						<5	48	48	100	78		
TDS	mg/L						45	495	571	866	1300		
TSS	mg/L						65	4	4	<1	9		
Al	mg/L												
As (Arsenic)	mg/L												
Cr (Chromium)	mg/L												
Cu (Copper)	mg/L												
Pb (Lead)	mg/L												
Ni (Nickel)	mg/L												
Zn (Zinc)	mg/L												
BENZENE	ug/L												
TOLUENE	ug/L												
ETHYLBENZENE	ug/L												
XYLENE	ug/L												
TOTAL BTEX	ug/L												
TRH C6 - C9	ug/L												
TRH C10 - C14	ug/L												
TRH C15 - C28	ug/L												
TRH C29 - C36	ug/L												
TOTAL TPH	ug/L												
Chloride, Cl	mg/L												
Calcium, Ca	mg/L												
Sodium, Na	mg/L												
RA-226													
RA-228													
Acrylamides													
Acrylic Acid													
TRH Surrogate (o-terphenyl)													

Month		Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
Date		2/01/19	4/02/19	1/03/19	1/04/19	1/05/19	4/06/19	2/07/19	5/08/19	3/09/19	2/10/19	5/11/19	2/12/19
Comments		Dry	Dry	Dry	Dry	Dry	Dry	Dry			Dry	Dry	Dry
Flow									0	1.5			
pH Field									7.05	7.08			
EC Field	uS/cm								2270	790			
Salinity	ppm								1130	390			
Acidity as CaCO3	mg/L								10	5			
NH3-N	mg/L												
EC Lab	uS/cm								2090	697			
Mg	mg/L												
pH Lab									7.4	7.5			
Sulphate	mg/L								120	43			
TDS	mg/L								1300	420			
TSS	mg/L								11	4			
Al	mg/L												
As (Arsenic)	mg/L												
Cr (Chromium)	mg/L												
Cu (Copper)	mg/L												
Pb (Lead)	mg/L												
Ni (Nickel)	mg/L												
Zn (Zinc)	mg/L												
BENZENE	ug/L												
TOLUENE	ug/L												
ETHYLBENZENE	ug/L												
XYLENE	ug/L												
TOTAL BTEX	ug/L												
TRH C6 - C9	ug/L												
TRH C10 - C14	ug/L												
TRH C15 - C28	ug/L												
TRH C29 - C36	ug/L												
TOTAL TPH	ug/L												
Chloride, Cl	mg/L												
Calcium, Ca	mg/L												
Sodium, Na	mg/L												
RA-226													
RA-228													
Acrylamides													
Acrylic Acid													
TRH Surrogate (o-terphenyl)													

Month		Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Date		2/01/20	3/02/20	3/03/20	1/04/20	1/05/20	2/06/20	1/07/20	3/08/20	1/09/20	1/10/20	2/11/20	1/12/20
Comments		Dry	Dry	Dry	Dry	Dry	Dry	Dry				Dry	Dry
Flow									0.25	0	0		
pH Field									7.3	7.06	7.2		
EC Field	uS/cm								2020	2730	2550		
Salinity	ppm								1010	1360	1270		
Acidity as CaCO3	mg/L								13	12	16		
NH3-N	mg/L												
EC Lab	uS/cm								1950	2640	2460		
Mg	mg/L												
pH Lab									7.4	7.3	7.4		
Sulphate	mg/L								97	130	67		
TDS	mg/L								1200	1500	1500		
TSS	mg/L								3	6	17		
Al	mg/L												
As (Arsenic)	mg/L												
Cr (Chromium)	mg/L												
Cu (Copper)	mg/L												
Pb (Lead)	mg/L												
Ni (Nickel)	mg/L												
Zn (Zinc)	mg/L												
BENZENE	ug/L												
TOLUENE	ug/L												
ETHYLBENZENE	ug/L												
XYLENE	ug/L												
TOTAL BTEX	ug/L												
TRH C6 - C9	ug/L												
TRH C10 - C14	ug/L												
TRH C15 - C28	ug/L												
TRH C29 - C36	ug/L												
TOTAL TPH	ug/L												
Chloride, Cl	mg/L												
Calcium, Ca	mg/L												
Sodium, Na	mg/L												
RA-226													
RA-228													
Acrylamides													
Acrylic Acid													
TRH Surrogate (o-terphenyl)													

Month		Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
Date		4/01/21	1/02/21	2/03/21	1/04/21	3/05/21	1/06/21	1/07/21	3/08/21	1/09/21	11/10/21	28/10/21	15/12/21
Comments		Dry	Dry	Dry	Dry	Dry	Dry						Dry
Flow								0	0.5	0.5	0	0	
pH Field								7.05	7.11	7.26	7.2	7.25	
EC Field	uS/cm							1330	1200	2760	2460	2670	
Salinity	ppm							670	600	1380	1230	1330	
Acidity as CaCO3	mg/L							17	9	10	7	6	
NH3-N	mg/L												
EC Lab	uS/cm							1240	1090	2580	2230	2550	
Mg	mg/L												
pH Lab								7.4	7.2	7.5	7.6	7.6	
Sulphate	mg/L							88	57	160	130	130	
TDS	mg/L							760	610	1500	1200	1200	
TSS	mg/L							7	3	4	6	8	
Al	mg/L												
As (Arsenic)	mg/L												
Cr (Chromium)	mg/L												
Cu (Copper)	mg/L												
Pb (Lead)	mg/L												
Ni (Nickel)	mg/L												
Zn (Zinc)	mg/L												
BENZENE	ug/L												
TOLUENE	ug/L												
ETHYLBENZENE	ug/L												
XYLENE	ug/L												
TOTAL BTEX	ug/L												
TRH C6 - C9	ug/L												
TRH C10 - C14	ug/L												
TRH C15 - C28	ug/L												
TRH C29 - C36	ug/L												
TOTAL TPH	ug/L												
Chloride, Cl	mg/L												
Calcium, Ca	mg/L												
Sodium, Na	mg/L												
RA-226													
RA-228													
Acrylamides													
Acrylic Acid													
TRH Surrogate (o-terphenyl)													

Month		Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
Date		6/01/22	3/02/22	8/03/22	17/04/22	23/05/22	22/06/22	26/07/22	30/08/22	26/09/22	26/10/22	17/11/22	15/12/23
Comments		Dry	Dry	Dry	Dry	Dry	Dry				Dry	Dry	Dry
Flow								0.5	0	0			
pH Field								7.02	6.82	7.05			
EC Field	uS/cm							1060	2200	1850			
Salinity	ppm							540	1100	920			
Acidity as CaCO3	mg/L							11	17	10			
NH3-N	mg/L												
EC Lab	uS/cm							846	2050	1840			
Mg	mg/L												
pH Lab								7	7.3	7			
Sulphate	mg/L							58	110	93			
TDS	mg/L							460	1100	1000			
TSS	mg/L							5	5	2			
Al	mg/L												
As (Arsenic)	mg/L												
Cr (Chromium)	mg/L												
Cu (Copper)	mg/L												
Pb (Lead)	mg/L												
Ni (Nickel)	mg/L												
Zn (Zinc)	mg/L												
BENZENE	ug/L												
TOLUENE	ug/L												
ETHYLBENZENE	ug/L												
XYLENE	ug/L												
TOTAL BTEX	ug/L												
TRH C6 - C9	ug/L												
TRH C10 - C14	ug/L												
TRH C15 - C28	ug/L												
TRH C29 - C36	ug/L												
TOTAL TPH	ug/L												
Chloride, Cl	mg/L												
Calcium, Ca	mg/L												
Sodium, Na	mg/L												
RA-226													
RA-228													
Acrylamides													
Acrylic Acid													
TRH Surrogate (o-terphenyl)													

YALSW11 Woddidup Creek flows___ downslope flows from central west of project area. NO MIXING WITH PRINCEFIELD DRAIN

Month		Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17
Date								18/07/17	25/07/17	14/08/17	18/09/17	10/10/17	2/11/17	5/12/17
Comments														Dry
Flow								0	0.25	1.5	0	0	0	
pH Field								6.92	7.05	7.1	7.04	7.14	7.18	
EC Field	uS/cm							2060	1110	590	1460	1720	2040	
Salinity	ppm							1030	550	300	730	860	1020	
Acidity as $CaCO_3$	mg/L							9	9	8	14	5	5	
NH_3-N	mg/L													
EC Lab	uS/cm							1950	1000	542	1340	1550	2340	
Mg	mg/L													
pH Lab								7.2	7.2	7.2	7	7.3	7.7	
Sulphate	mg/L							140	75	34	81	95	98	
TDS	mg/L							1200	650	340	680	850	1300	
TSS	mg/L							3	3	4	4	4	11	
Al	mg/L													
As (Arsenic)	mg/L													
Cr (Chromium)	mg/L													
Cu (Copper)	mg/L													
Pb (Lead)	mg/L													
Ni (Nickel)	mg/L													
Zn (Zinc)	mg/L													
BENZENE	ug/L													
TOLUENE	ug/L													
ETHYLBENZENE	ug/L													
XYLENE	ug/L													
TOTAL BTEX	ug/L													
TRH C6 - C9	ug/L													
TRH C10 - C14	ug/L													
TRH C15 - C28	ug/L													
TRH C29 - C36	ug/L													
TOTAL TPH	ug/L													
Chloride, Cl	mg/L													
Calcium, Ca	mg/L													
Sodium, Na	mg/L													
RA-226														
RA-228														
Acrylamides														
Acrylic Acid														
TRH Surrogate (o-terphenyl)														

Month		Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
Date		2/01/18	1/02/18	1/03/18	3/04/18	1/05/18	5/06/18	3/07/18	2/08/18	4/09/18	2/10/18	1/11/18	3/12/18
Comments		Dry	Dry	Dry	Dry	Dry							Dry
Flow							1	1.5	2	1	0	0	
pH Field							6.5	6.9	7.02	6.81	6.75	6.82	
EC Field	uS/cm						630	750	840	1140	1570	2740	
Salinity	ppm						310	380	420	570	780	1370	
Acidity as $CaCO_3$	mg/L						6	7	6	9	4	10	
NH_3-N	mg/L												
EC Lab	uS/cm						547	650	724	964	1450	2640	
Mg	mg/L												
pH Lab							6.6	7.2	7.1	7	7.6	7.3	
Sulphate	mg/L						40	46	43	59	78	98	
TDS	mg/L						293	400	431	495	850	1400	
TSS	mg/L						84	8	5	3	3	20	
Al	mg/L												
As (Arsenic)	mg/L												
Cr (Chromium)	mg/L												
Cu (Copper)	mg/L												
Pb (Lead)	mg/L												
Ni (Nickel)	mg/L												
Zn (Zinc)	mg/L												
BENZENE	ug/L												
TOLUENE	ug/L												
ETHYLBENZENE	ug/L												
XYLENE	ug/L												
TOTAL BTEX	ug/L												
TRH C6 - C9	ug/L												
TRH C10 - C14	ug/L												
TRH C15 - C28	ug/L												
TRH C29 - C36	ug/L												
TOTAL TPH	ug/L												
Chloride, Cl	mg/L												
Calcium, Ca	mg/L												
Sodium, Na	mg/L												
RA-226													
RA-228													
Acrylamides													
Acrylic Acid													
TRH Surrogate (o-terphenyl)													

Month		Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
Date		2/01/19	4/02/19	1/03/19	1/04/19	1/05/19	4/06/19	2/07/19	5/08/19	3/09/19	2/10/19	5/11/19	2/12/19
Comments		Dry	Dry	Dry	Dry	Dry	Dry					Dry	Dry
Flow								0	0	2	0		
pH Field								6.73	6.92	6.7	7.1		
EC Field	uS/cm							1380	1200	810	1400		
Salinity	ppm							690	600	400	700		
Acidity as $CaCO_3$	mg/L							5	8	5	9		
NH_3-N	mg/L												
EC Lab	uS/cm							1300	1050	675	1220		
Mg	mg/L												
pH Lab								7.1	7.2	7.2	7.6		
Sulphate	mg/L							110	65	46	40		
TDS	mg/L							760	650	420	670		
TSS	mg/L							3	5	5	6		
Al	mg/L												
As (Arsenic)	mg/L												
Cr (Chromium)	mg/L												
Cu (Copper)	mg/L												
Pb (Lead)	mg/L												
Ni (Nickel)	mg/L												
Zn (Zinc)	mg/L												
BENZENE	ug/L												
TOLUENE	ug/L												
ETHYLBENZENE	ug/L												
XYLENE	ug/L												
TOTAL BTEX	ug/L												
TRH C6 - C9	ug/L												
TRH C10 - C14	ug/L												
TRH C15 - C28	ug/L												
TRH C29 - C36	ug/L												
TOTAL TPH	ug/L												
Chloride, Cl	mg/L												
Calcium, Ca	mg/L												
Sodium, Na	mg/L												
RA-226													
RA-228													
Acrylamides													
Acrylic Acid													
TRH Surrogate (o-terphenyl)													

Month		Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Date		2/01/20	3/02/20	3/03/20	1/04/20	1/05/20	2/06/20	1/07/20	3/08/20	1/09/20	1/10/20	2/11/20	1/12/20
Comments		Dry	Dry	Dry	Dry	Dry	Dry					Dry	Dry
Flow								0	1	0	0		
pH Field								7.06	7.1	7	7		
EC Field	uS/cm							700	870	1090	1160		
Salinity	ppm							350	430	550	580		
Acidity as $CaCO_3$	mg/L							9	8	9	10		
NH_3-N	mg/L												
EC Lab	uS/cm							676	793	996	1090		
Mg	mg/L												
pH Lab								7.2	7.2	7.2	7.2		
Sulphate	mg/L							38	36	53	49		
TDS	mg/L							430	460	510	650		
TSS	mg/L							4	6	5	7		
Al	mg/L												
As (Arsenic)	mg/L												
Cr (Chromium)	mg/L												
Cu (Copper)	mg/L												
Pb (Lead)	mg/L												
Ni (Nickel)	mg/L												
Zn (Zinc)	mg/L												
BENZENE	ug/L												
TOLUENE	ug/L												
ETHYLBENZENE	ug/L												
XYLENE	ug/L												
TOTAL BTEX	ug/L												
TRH C6 - C9	ug/L												
TRH C10 - C14	ug/L												
TRH C15 - C28	ug/L												
TRH C29 - C36	ug/L												
TOTAL TPH	ug/L												
Chloride, Cl	mg/L												
Calcium, Ca	mg/L												
Sodium, Na	mg/L												
RA-226													
RA-228													
Acrylamides													
Acrylic Acid													
TRH Surrogate (o-terphenyl)													

Month		Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
Date		4/01/21	1/02/21	2/03/21	1/04/21	3/05/21	1/06/21	1/07/21	3/08/21	2/09/21	11/10/21	28/10/21	15/12/21
Comments		Dry	Dry	Dry	Dry	Dry							Dry
Flow							0	1	0.05	0.5	0.5	0.5	
pH Field							6.7	6.78	7.02	7.3	7.17	7.35	
EC Field	uS/cm						440	980	900	1200	1300	1360	
Salinity	ppm						220	490	450	600	650	680	
Acidity as $CaCO_3$	mg/L						11	10	7	11	5	4	
NH_3-N	mg/L												
EC Lab	uS/cm						398	901	812	1140	1220	1250	
Mg	mg/L												
pH Lab							6.8	7.3	7.1	7.5	7.5	7.6	
Sulphate	mg/L						14	49	41	41	63	53	
TDS	mg/L						260	530	480	650	590	620	
TSS	mg/L						7	6	8	6	6	4	
Al	mg/L												
As (Arsenic)	mg/L												
Cr (Chromium)	mg/L												
Cu (Copper)	mg/L												
Pb (Lead)	mg/L												
Ni (Nickel)	mg/L												
Zn (Zinc)	mg/L												
BENZENE	ug/L												
TOLUENE	ug/L												
ETHYLBENZENE	ug/L												
XYLENE	ug/L												
TOTAL BTEX	ug/L												
TRH C6 - C9	ug/L												
TRH C10 - C14	ug/L												
TRH C15 - C28	ug/L												
TRH C29 - C36	ug/L												
TOTAL TPH	ug/L												
Chloride, Cl	mg/L												
Calcium, Ca	mg/L												
Sodium, Na	mg/L												
RA-226													
RA-228													
Acrylamides													
Acrylic Acid													
TRH Surrogate (o-terphenyl)													

Month		Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
Date		6/01/22	3/02/22	8/03/22	17/04/22	23/05/22	22/06/22	19/07/22	11/08/22	26/09/22	26/10/22	17/11/22	15/12/23
Comments		Dry	Dry	Dry	Dry	Dry	Dry				Dry	Dry	Dry
Flow								1	2	0			
pH Field								7.05	6.9	7.16			
EC Field	uS/cm							1670	1140	1160			
Salinity	ppm							890	570	570			
Acidity as $CaCO_3$	mg/L							8	6	10			
NH_3-N	mg/L												
EC Lab	uS/cm							1380	1060	1120			
Mg	mg/L												
pH Lab								7.6	7.4	6.9			
Sulphate	mg/L							98	110	61			
TDS	mg/L							680	610	620			
TSS	mg/L							6	8	7			
Al	mg/L												
As (Arsenic)	mg/L												
Cr (Chromium)	mg/L												
Cu (Copper)	mg/L												
Pb (Lead)	mg/L												
Ni (Nickel)	mg/L												
Zn (Zinc)	mg/L												
BENZENE	ug/L												
TOLUENE	ug/L												
ETHYLBENZENE	ug/L												
XYLENE	ug/L												
TOTAL BTEX	ug/L												
TRH C6 - C9	ug/L												
TRH C10 - C14	ug/L												
TRH C15 - C28	ug/L												
TRH C29 - C36	ug/L												
TOTAL TPH	ug/L												
Chloride, Cl	mg/L												
Calcium, Ca	mg/L												
Sodium, Na	mg/L												
RA-226													
RA-228													
Acrylamides													
Acrylic Acid													
TRH Surrogate (o-terphenyl)													

YALSW12 Un-named Creek/Artificial drains in centre of project. NO MIXING WITH PRINCEFIELD DRAIN.

Month		Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
Date								18/07/17	14/08/17	18/09/17	10/10/17	2/11/17	5/12/17	2/01/18	1/02/18	1/03/18	3/04/18	1/05/18	5/06/18	3/07/18	2/08/18	4/09/18	2/10/18	1/11/18	3/12/18
Comments								Dry		Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry					Dry	Dry	Dry
Flow									2.5										2.5	1.5	2	1			
pH Field									7.09										6.6	7.01	7.08	7.05			
EC Field	uS/cm								640										300	920	1150	1340			
Salinity	ppm								320										150	460	570	670			
Acidity as CaCO3	mg/L								8										4	7	5	7			
NH3-N	mg/L																								
EC Lab	uS/cm								582										246	818	1020	1150			
Mg	mg/L																								
pH Lab									7.3										6.6	7.3	7.3	7.3			
Sulphate	mg/L								36										22	60	60	74			
TDS	mg/L								340										126	500	599	593			
TSS	mg/L								2										132	8	5	<1			
Al	mg/L																								
As (Arsenic)	mg/L																								
Cr (Chromium)	mg/L																								
Cu (Copper)	mg/L																								
Pb (Lead)	mg/L																								
Ni (Nickel)	mg/L																								
Zn (Zinc)	mg/L																								
BENZENE	ug/L																								
TOLUENE	ug/L																								
ETHYLBENZENE	ug/L																								
XYLENE	ug/L																								
TOTAL BTEX	ug/L																								
TRH C6 - C9	ug/L																								
TRH C10 - C14	ug/L																								
TRH C15 - C28	ug/L																								
TRH C29 - C36	ug/L																								
TOTAL TPH	ug/L																								
Chloride, Cl	mg/L																								
Calcium, Ca	mg/L																								
Sodium, Na	mg/L																								
RA-226																									
RA-228																									
Acrylamides																									
Acrylic Acid																									
TRH Surrogate (o-terphenyl)																									

Month		Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Date		2/01/19	4/02/19	1/03/19	1/04/19	1/05/19	4/06/19	2/07/19	5/08/19	3/09/19	2/10/19	5/11/19	2/12/19	2/01/20	3/02/20	3/03/20	1/04/20	1/05/20	2/06/20	1/07/20	3/08/20	1/09/20	1/10/20	2/11/20	1/12/20
Comments		Dry	Dry	Dry	Dry	Dry	Dry				Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry				Dry	Dry
Flow								0.25	0.5	2											1	1	0		
pH Field								7.01	7.04	6.84											7.14	7.35	7.49		
EC Field	uS/cm							2060	1920	1100											1660	1450	1360		
Salinity	ppm							1030	960	550											830	720	680		
Acidity as CaCO3	mg/L							5	7	5											8	5	4		
NH3-N	mg/L																								
EC Lab	uS/cm							1980	1790	970											1610	1390	1320		
Mg	mg/L																								
pH Lab								7.4	7.5	7.3											7.3	7.6	7.8		
Sulphate	mg/L							130	87	58											95	75	70		
TDS	mg/L							1100	100	530											960	750	760		
TSS	mg/L							5	37	10											9	5	8		
Al	mg/L																								
As (Arsenic)	mg/L																								
Cr (Chromium)	mg/L																								
Cu (Copper)	mg/L																								
Pb (Lead)	mg/L																								
Ni (Nickel)	mg/L																								
Zn (Zinc)	mg/L																								
BENZENE	ug/L																								
TOLUENE	ug/L																								
ETHYLBENZENE	ug/L																								
XYLENE	ug/L																								
TOTAL BTEX	ug/L																								
TRH C6 - C9	ug/L																								
TRH C10 - C14	ug/L																								
TRH C15 - C28	ug/L																								
TRH C29 - C36	ug/L																								
TOTAL TPH	ug/L																								
Chloride, Cl	mg/L																								
Calcium, Ca	mg/L																								
Sodium, Na	mg/L																								
RA-226																									
RA-228																									
Acrylamides																									
Acrylic Acid																									
TRH Surrogate (o-terphenyl)																									

Month		Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
Date		4/01/21	1/02/21	2/03/21	1/04/21	3/05/21	1/06/21	1/07/21	3/08/21	2/09/21	11/10/21	28/10/21	15/12/21	6/01/22	3/02/22	8/03/22	17/04/22	23/05/22	22/06/22	21/07/22	10/08/22	28/09/22	26/10/22	17/11/22	15/12/23
Comments		Dry	Dry	Dry	Dry	Dry	Dry						Dry	Dry	Dry	Dry	Dry	Dry	Dry				Dry	Dry	Dry
Flow								2	2	1	0	0.5								1	2	0			
pH Field								6.90	7.18	7.75	6.91	7.81								7.36	7.15	7.03			
EC Field	uS/cm							3140	960	1660	1470	1540								1340	1980	2620			
Salinity	ppm							1570	480	830	730	770								680	990	1290			
Acidity as CaCO3	mg/L							14	6	7	13	<2								5	4	10			
NH3-N	mg/L																								
EC Lab	uS/cm							3050	865	1580	1400	1440								1490	1910	2460			
Mg	mg/L																								
pH Lab								7.5	7.2	7.8	7.2	7.8								8	7.7	7.4			
Sulphate	mg/L							200	48	91	77	85								60	270	170			
TDS	mg/L							1800	510	840	670	700								770	1100	1300			
TSS	mg/L							7	4	10	69	5								15	27	6			
Al	mg/L																								
As (Arsenic)	mg/L																								
Cr (Chromium)	mg/L																								
Cu (Copper)	mg/L																								
Pb (Lead)	mg/L																								
Ni (Nickel)	mg/L																								
Zn (Zinc)	mg/L																								
BENZENE	ug/L																								
TOLUENE	ug/L																								
ETHYLBENZENE	ug/L																								
XYLENE	ug/L																								
TOTAL BTEX	ug/L																								
TRH C6 - C9	ug/L																								
TRH C10 - C14	ug/L																								
TRH C15 - C28	ug/L																								
TRH C29 - C36	ug/L																								
TOTAL TPH	ug/L																								
Chloride, Cl	mg/L																								
Calcium, Ca	mg/L																								
Sodium, Na	mg/L																								
RA-226																									
RA-228																									
Acrylamides																									
Acrylic Acid																									
TRH Surrogate (o-terphenyl)																									

YALSW13 **Roadside drain downslope flows from north east of project area.**

Month		Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
Date								18/07/17	14/08/17	18/09/17	10/10/17	2/11/17	5/12/17	2/01/18	1/02/18	1/03/18	3/04/18	1/05/18	5/06/18	3/07/18	2/08/18	4/09/18	2/10/18	1/11/18	3/12/18
Comments										Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry					Dry	Dry	Dry
Flow								0	1.5										3	2	2	1			
pH Field								6.98	7.1										6.58	7.01	7.04	6.96			
EC Field	uS/cm							1910	680										80	840	1110	1590			
Salinity	ppm							950	340										40	420	550	790			
Acidity as CaCO3	mg/L							6	10										7	7	6	9			
NH3-N	mg/L																								
EC Lab	uS/cm							1800	624										62	728	972	1370			
Mg	mg/L																								
pH Lab								7.2	7.2										6.4	7.3	7.2	7.2			
Sulphate	mg/L							100	32										<5	49	53	72			
TDS	mg/L							1000	380										31	467	568	727			
TSS	mg/L							3	6										105	3	2	2			
Al	mg/L																								
As (Arsenic)	mg/L																								
Cr (Chromium)	mg/L																								
Cu (Copper)	mg/L																								
Pb (Lead)	mg/L																								
Ni (Nickel)	mg/L																								
Zn (Zinc)	mg/L																								
BENZENE	ug/L																								
TOLUENE	ug/L																								
ETHYLBENZENE	ug/L																								
XYLENE	ug/L																								
TOTAL BTEX	ug/L																								
TRH C6 - C9	ug/L																								
TRH C10 - C14	ug/L																								
TRH C15 - C28	ug/L																								
TRH C29 - C36	ug/L																								
TOTAL TPH	ug/L																								
Chloride, Cl	mg/L																								
Calcium, Ca	mg/L																								
Sodium, Na	mg/L																								
RA-226																									
RA-228																									
Acrylamides																									
Acrylic Acid																									
TRH Surrogate (o-terphenyl)																									

Month		Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Date		2/01/19	4/02/19	1/03/19	1/04/19	1/05/19	4/06/19	2/07/19	5/08/19	3/09/19	2/10/19	5/11/19	2/12/19	2/01/20	3/02/20	3/03/20	1/04/20	1/05/20	2/06/20	1/07/20	3/08/20	1/09/20	1/10/20	2/11/20	1/12/20
Comments		Dry	Dry	Dry	Dry	Dry	Dry				Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry			Dry	Dry	Dry
Flow								0	0	2											1	0.5			
pH Field								6.95	6.9	6.95											7.3	7.45			
EC Field	uS/cm							1300	1890	840											1270	1850			
Salinity	ppm							650	940	420											630	920			
Acidity as CaCO3	mg/L							5	11	6											7	3			
NH3-N	mg/L																								
EC Lab	uS/cm							1190	1750	721											1200	1790			
Mg	mg/L																								
pH Lab								7	7.1	7.3											7.5	7.9			
Sulphate	mg/L							77	86	29											42	90			
TDS	mg/L							660	1000	470											720	940			
TSS	mg/L							<1	11	3											5	27			
Al	mg/L																								
As (Arsenic)	mg/L																								
Cr (Chromium)	mg/L																								
Cu (Copper)	mg/L																								
Pb (Lead)	mg/L																								
Ni (Nickel)	mg/L																								
Zn (Zinc)	mg/L																								
BENZENE	ug/L																								
TOLUENE	ug/L																								
ETHYLBENZENE	ug/L																								
XYLENE	ug/L																								
TOTAL BTEX	ug/L																								
TRH C6 - C9	ug/L																								
TRH C10 - C14	ug/L																								
TRH C15 - C28	ug/L																								
TRH C29 - C36	ug/L																								
TOTAL TPH	ug/L																								
Chloride, Cl	mg/L																								
Calcium, Ca	mg/L																								
Sodium, Na	mg/L																								
RA-226																									
RA-228																									
Acrylamides																									
Acrylic Acid																									
TRH Surrogate (o-terphenyl)																									

Month		Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
Date		4/01/21	1/02/21	2/03/2021	1/04/21	3/05/21	1/06/21	1/07/21	3/08/21	2/09/21	11/10/21	28/10/21	15/12/21	6/01/22	3/02/22	8/03/22	17/04/22	23/05/22	22/06/22	26/07/22	30/08/22	26/09/22	26/10/22	17/11/22	15/12/23
Comments		Dry	Dry	Dry	Dry								Dry	Dry	Dry	Dry	Dry	Dry	Dry				Dry	Dry	Dry
Flow						0	0	0.5	1.5	0.5	0	0								0	0	0			
pH Field						6.87	6.8	7.11	7.15	7.48	6.87	7.37								6.99	8.11	7.46			
EC Field	uS/cm					1200	960	1680	1140	1930	2080	1550								1360	3200	3010			
Salinity	ppm					600	480	830	570	960	1040	780								680	1590	1500			
Acidity as CaCO3	mg/L					14	12	9	7	8	14	4								10	2	6			
NH3-N	mg/L																								
EC Lab	uS/cm					1160	914	1530	1030	1840	1930	1450								1280	3090	2970			
Mg	mg/L																								
pH Lab						7	7.1	7.7	7.2	7.8	7.3	7.4								7.2	8.1	7.8			
Sulphate	mg/L					70	54	76	46	78	65	94								88	320	200			
TDS	mg/L					670	510	940	580	1100	920	730								710	1600	1600			
TSS	mg/L					31	5	4	4	5	160	24								22	17	2			
Al	mg/L																								
As (Arsenic)	mg/L																								
Cr (Chromium)	mg/L																								
Cu (Copper)	mg/L																								
Pb (Lead)	mg/L																								
Ni (Nickel)	mg/L																								
Zn (Zinc)	mg/L																								
BENZENE	ug/L																								
TOLUENE	ug/L																								
ETHYLBENZENE	ug/L																								
XYLENE	ug/L																								
TOTAL BTEX	ug/L																								
TRH C6 - C9	ug/L																								
TRH C10 - C14	ug/L																								
TRH C15 - C28	ug/L																								
TRH C29 - C36	ug/L																								
TOTAL TPH	ug/L																								
Chloride, Cl	mg/L																								
Calcium, Ca	mg/L																								
Sodium, Na	mg/L																								
RA-226																									
RA-228																									
Acrylamides																									
Acrylic Acid																									
TRH Surrogate (o-terphenyl)																									

YALSW14 Roadside drain downslope flows from north east of project area

Month		Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17
Date								18/07/17	14/08/17	18/09/17	10/10/14	2/11/17	5/12/17
Comments								Dry		Dry		Dry	Dry
Flow									1.5		0		
pH Field									7.18		7.5		
EC Field	uS/cm								670		2190		
Salinity	ppm								340		1090		
Acidity as CaCO3	mg/L								7		6		
NH3-N	mg/L												
EC Lab	uS/cm								617		2000		
Mg	mg/L												
pH Lab									7.4		7.6		
Sulphate	mg/L								34		88		
TDS	mg/L								300		1100		
TSS	mg/L								<1		11		
Al	mg/L												
As (Arsenic)	mg/L												
Cr (Chromium)	mg/L												
Cu (Copper)	mg/L												
Pb (Lead)	mg/L												
Ni (Nickel)	mg/L												
Zn (Zinc)	mg/L												
BENZENE	ug/L												
TOLUENE	ug/L												
ETHYLBENZENE	ug/L												
XYLENE	ug/L												
TOTAL BTEX	ug/L												
TRH C6 - C9	ug/L												
TRH C10 - C14	ug/L												
TRH C15 - C28	ug/L												
TRH C29 - C36	ug/L												
TOTAL TPH	ug/L												
Chloride, Cl	mg/L												
Calcium, Ca	mg/L												
Sodium, Na	mg/L												
RA-226													
RA-228													
Acrylamides													
Acrylic Acid													
TRH Surrogate (o-terphenyl)													

Month		Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
Date		2/01/18	1/02/18	1/03/18	3/04/18	1/05/18	5/06/18	3/07/18	2/08/18	4/09/18	2/10/18	1/11/18	3/12/18
Comments		Dry	Dry	Dry	Dry	Dry					Dry	Dry	Dry
Flow							3	1.5	2	0.5			
pH Field							6.65	7.01	7.1	6.75			
EC Field	uS/cm						440	870	1090	1140			
Salinity	ppm						220	430	540	570			
Acidity as CaCO3	mg/L						4	6	5	14			
NH3-N	mg/L												
EC Lab	uS/cm						384	751	967	950			
Mg	mg/L												
pH Lab							6.8	7.3	7.3	7			
Sulphate	mg/L						39	51	52	42			
TDS	mg/L						218	477	546	527			
TSS	mg/L						19	2	1	1			
Al	mg/L												
As (Arsenic)	mg/L												
Cr (Chromium)	mg/L												
Cu (Copper)	mg/L												
Pb (Lead)	mg/L												
Ni (Nickel)	mg/L												
Zn (Zinc)	mg/L												
BENZENE	ug/L												
TOLUENE	ug/L												
ETHYLBENZENE	ug/L												
XYLENE	ug/L												
TOTAL BTEX	ug/L												
TRH C6 - C9	ug/L												
TRH C10 - C14	ug/L												
TRH C15 - C28	ug/L												
TRH C29 - C36	ug/L												
TOTAL TPH	ug/L												
Chloride, Cl	mg/L												
Calcium, Ca	mg/L												
Sodium, Na	mg/L												
RA-226													
RA-228													
Acrylamides													
Acrylic Acid													
TRH Surrogate (o-terphenyl)													

Month		Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
Date		2/01/19	4/02/19	1/03/19	1/04/19	1/05/19	4/06/19	2/07/19	5/08/19	3/09/19	2/10/19	5/11/19	2/12/19
Comments		Dry	Dry	Dry	Dry	Dry	Dry					Dry	Dry
Flow								0.25	0	1.75	0		
pH Field								7.06	7.13	6.95	7.2		
EC Field	uS/cm							1260	2150	920	2530		
Salinity	ppm							630	1070	460	1270		
Acidity as CaCO3	mg/L							5	6	6	6		
NH3-N	mg/L												
EC Lab	uS/cm							1170	2030	809	2340		
Mg	mg/L												
pH Lab								7.3	7.6	7.2	7.7		
Sulphate	mg/L							60	96	37	99		
TDS	mg/L							710	1200	490	1300		
TSS	mg/L							2	5	2	5		
Al	mg/L												
As (Arsenic)	mg/L												
Cr (Chromium)	mg/L												
Cu (Copper)	mg/L												
Pb (Lead)	mg/L												
Ni (Nickel)	mg/L												
Zn (Zinc)	mg/L												
BENZENE	ug/L												
TOLUENE	ug/L												
ETHYLBENZENE	ug/L												
XYLENE	ug/L												
TOTAL BTEX	ug/L												
TRH C6 - C9	ug/L												
TRH C10 - C14	ug/L												
TRH C15 - C28	ug/L												
TRH C29 - C36	ug/L												
TOTAL TPH	ug/L												
Chloride, Cl	mg/L												
Calcium, Ca	mg/L												
Sodium, Na	mg/L												
RA-226													
RA-228													
Acrylamides													
Acrylic Acid													
TRH Surrogate (o-terphenyl)													

Month		Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20
Date		2/01/20	3/02/20	3/03/20	1/04/20	1/05/20	2/06/20	1/07/20	3/08/20	1/09/20	1/10/20	2/11/20	1/12/20
Comments		Dry	Dry	Dry	Dry	Dry	Dry					Dry	Dry
Flow								0.25	0.75	0.5	0		
pH Field								7.25	7.25	7.4	7.4		
EC Field	uS/cm							790	1240	2340	2230		
Salinity	ppm							390	620	1170	1120		
Acidity as CaCO3	mg/L							8	8	6	6		
NH3-N	mg/L												
EC Lab	uS/cm							780	1220	2350	2140		
Mg	mg/L												
pH Lab								7.5	7.4	7.7	7.7		
Sulphate	mg/L							3	40	110	100		
TDS	mg/L							510	740	1300	1200		
TSS	mg/L							3	7	3	4		
Al	mg/L												
As (Arsenic)	mg/L												
Cr (Chromium)	mg/L												
Cu (Copper)	mg/L												
Pb (Lead)	mg/L												
Ni (Nickel)	mg/L												
Zn (Zinc)	mg/L												
BENZENE	ug/L												
TOLUENE	ug/L												
ETHYLBENZENE	ug/L												
XYLENE	ug/L												
TOTAL BTEX	ug/L												
TRH C6 - C9	ug/L												
TRH C10 - C14	ug/L												
TRH C15 - C28	ug/L												
TRH C29 - C36	ug/L												
TOTAL TPH	ug/L												
Chloride, Cl	mg/L												
Calcium, Ca	mg/L												
Sodium, Na	mg/L												
RA-226													
RA-228													
Acrylamides													
Acrylic Acid													
TRH Surrogate (o-terphenyl)													

Month		Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
Date		4/01/21	1/02/21	2/03/21	1/04/21	3/05/21	1/06/21	1/07/21	3/08/21	2/09/21	11/10/21	28/10/21	15/12/21
Comments		Dry	Dry	Dry	Dry	Dry							Dry
Flow							0	0	1	0	0	0	
pH Field							6.8	6.98	7.16	7.32	7.39	6.8	
EC Field	uS/cm						880	1630	1010	2140	2020	1750	
Salinity	ppm						440	820	510	1070	1010	870	
Acidity as CaCO3	mg/L						10	15	7	11	6	8	
NH3-N	mg/L												
EC Lab	uS/cm						795	1530	897	2030	1950	1650	
Mg	mg/L												
pH Lab							7.2	7.5	7.3	7.6	7.7	7.1	
Sulphate	mg/L						15	77	34	59	77	96	
TDS	mg/L						510	930	520	1200	940	880	
TSS	mg/L						21	3	3	5	9	34	
Al	mg/L												
As (Arsenic)	mg/L												
Cr (Chromium)	mg/L												
Cu (Copper)	mg/L												
Pb (Lead)	mg/L												
Ni (Nickel)	mg/L												
Zn (Zinc)	mg/L												
BENZENE	ug/L												
TOLUENE	ug/L												
ETHYLBENZENE	ug/L												
XYLENE	ug/L												
TOTAL BTEX	ug/L												
TRH C6 - C9	ug/L												
TRH C10 - C14	ug/L												
TRH C15 - C28	ug/L												
TRH C29 - C36	ug/L												
TOTAL TPH	ug/L												
Chloride, Cl	mg/L												
Calcium, Ca	mg/L												
Sodium, Na	mg/L												
RA-226													
RA-228													
Acrylamides													
Acrylic Acid													
TRH Surrogate (o-terphenyl)													

Month		Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
Date		6/01/22	3/02/22	8/03/22	17/04/22	23/05/22	22/06/22	21/07/22	11/08/22	26/09/22	26/10/22	17/11/22	15/12/23
Comments		Dry	Dry	Dry	Dry	Dry	Dry				Dry	Dry	Dry
Flow								1	1	0			
pH Field								7.78	7.61	7.64			
EC Field	uS/cm							2170	1820	2930			
Salinity	ppm							1110	910	1400			
Acidity as CaCO3	mg/L							3	5	4			
NH3-N	mg/L												
EC Lab	uS/cm							2620	1730	2800			
Mg	mg/L												
pH Lab								8.3	7.6	8.1			
Sulphate	mg/L							310	240	280			
TDS	mg/L							1300	1730	1900			
TSS	mg/L							14	5	6			
Al	mg/L												
As (Arsenic)	mg/L												
Cr (Chromium)	mg/L												
Cu (Copper)	mg/L												
Pb (Lead)	mg/L												
Ni (Nickel)	mg/L												
Zn (Zinc)	mg/L												
BENZENE	ug/L												
TOLUENE	ug/L												
ETHYLBENZENE	ug/L												
XYLENE	ug/L												
TOTAL BTEX	ug/L												
TRH C6 - C9	ug/L												
TRH C10 - C14	ug/L												
TRH C15 - C28	ug/L												
TRH C29 - C36	ug/L												
TOTAL TPH	ug/L												
Chloride, Cl	mg/L												
Calcium, Ca	mg/L												
Sodium, Na	mg/L												
RA-226													
RA-228													
Acrylamides													
Acrylic Acid													
TRH Surrogate (o-terphenyl)													

YALSW15

Month	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
Date	10/08/2022	26/09/22	26/10/22	17/11/22	15/12/23
Comments		Dry	Dry	Dry	Dry
Flow	0.5				
pH Field					
EC Field					
Salinity					
Acidity as CaCO3	<2				
NH3-N					
EC Lab	450				
Mg					
pH Lab	7.7				
Sulphate	25				
TDS	310				
TSS	57				
Al					
As (Arsenic)					
Cr (Chromium)					
Cu (Copper)					
Pb (Lead)					
Ni (Nickel)					
Zn (Zinc)					
BENZENE					
TOLUENE					
ETHYLBENZENE					
XYLENE					
TOTAL BTEX					
TRH C6 - C9					
TRH C10 - C14					
TRH C15 - C28					
TRH C29 - C36					
TOTAL TPH					
Chloride, Cl					
Calcium, Ca					
Sodium, Na					
RA-226					
RA-228					
Acrylamides					
Acrylic Acid					
RH Surrogate (o-terphenyl)					

APPENDIX F

Stratham Monitoring Spring 2023

Doral Stratham Offset Revegetation Monitoring Quadrat 1

Spring 2023 (To be compiled annually)

Project Name: P188 Doral Yalyalup - Stratham Offset	**Table Key:**	Species Present	
Quadrat Size: 5 m x 5 m		Overstorey Species	^
Date: 26/9/23		Black Cockatoo Habitat Species	
GPS Coordinates: 50s 372095 mE 6295537 mS		DRF / Priority Species	

Landform and Soil Description: Flat, scalped and mounded (300mm) ground, grey sandy loam with surface crust

Native Species	Stem Count	Weed/Invasive Species	Cover %
Acacia saligna	2	*Arctotheca calendula* (Cape Weed)	
Agonis flexuosa	2	*Avena fatua* (Wild Oats)	25%
Allocasuarina humilis		*Briza minor* (Lesser Quarking-Grass)	5%
^*Allocasuarina fraseriana*		*Chenpodium pumilio* (Goosefoot)	
^*Banksia attentuata*		*Cynodon dactylon* (Couch)	
^*Banksia grandis*		*Ehrharta longiflora* (Annual Veldt)	
^*Corymbia calophylla*	2	*Isolepis cyperoides*	
^*Eucalyptus marginata*	1	*Lolium rigidum* (Annual Ryegrass)	65%
^*Eucalyptus rudis*		*Lotus angustissimus* (Narrowleaf Trefoil)	
Kunzea micrantha		*Lythrum hyssopifolia* (Lesser Loosestrife)	0%
Melaleuca incana		*Mentha pulegium* (Pennyroyal)	
Melaleuca osullivanii		*Ranunculus muricatus* (Sharp Buttercup)	
Melaleuca viminea		*Phalaris aquatica* (Canary Grass)	
Pericalymma elipticum		*Solanum nigrum* (Blackberry Nightshade)	
Patersonia occidentalis			
Viminaria juncea			
Xylomelum occidentalis			

Other Species / Natural Recruitment of Natives	Stem Count	Average Health of Revegetation	
Unknown		0 - Dead Shrub	
Juncus subsecundus		1 - Surviving but very unhealthy / unlikely to survive	
		2 - Leaf die off / yellowing clearly visible throughout	
		3 - Leaf die off / yellowing present but not abundant	
		4 - Healthy plant	
		5 - Healthy plant with signs of positive growth	5
		Other Observations	
		Weed Cover (%)	95%
		Herbivory signs - insect / animal	No
		Dieback signs (Canopy loss/Proteacea sp. loss etc.)	No
		Photo from NW corner of Quadrat	Yes
		Quadrat Summary	
		Overstorey stems / hectare	**1200**
		Black Cockatoo habitat species stems / hectare	**1200**
		Understorey stems / hectare	**2800**
		Total stems / hectare	**4000**
		Native species richness	**4**

Comments

19/1/23 : All fences and gates in tact and good condition

19/1/23 : All annual weeds noted are dead, forming good cover for topsoil protection

19/1/23 : Red-Tailed Black Cockatoo feather found in quadrat

26/9/23 : Annual weeds not yet dead, though high in cover are unlikely to impact seedlings

Doral Stratham Offset Revegetation Monitoring Quadrat 2

Spring 2023 (To be compiled annually)

Project Name: P188 Doral Yalyalup - Stratham Offset	**Table Key:**	Species Present	
Quadrat Size: 5 m x 5 m		Overstorey Species	^
Date: 26/9/23		Black Cockatoo Habitat Species	
GPS Coordinates: 50s 372072 mE 6295442 mS		DRF / Priority Species	

Landform and Soil Description: Flat, scalped and mounded (300mm) ground, grey sandy loam with surface crust

Native Species	Stem Count	Weed/Invasive Species	Cover %
Acacia saligna		*Arctotheca calendula* (Cape Weed)	85%
Agonis flexuosa		*Avena fatua* (Wild Oats)	
Allocasuarina humilis		*Briza minor* (Lesser Quarking-Grass)	
^Allocasuarina fraseriana		*Chenpodium pumilio* (Goosefoot)	
^Banksia attentuata		*Cynodon dactylon* (Couch)	
^Banksia grandis		*Ehrharta longiflora* (Annual Veldt)	2%
^Corymbia calophylla		*Isolepis cyperoides*	
^Eucalyptus marginata		*Lolium rigidum* (Annual Ryegrass)	6%
^Eucalyptus rudis		*Lotus angustissimus* (Narrowleaf Trefoil)	
Kunzea micrantha	**5**	*Lythrum hyssopifolia* (Lesser Loosestrife)	
Melaleuca incana	**1**	*Mentha pulegium* (Pennyroyal)	
Melaleuca osullivanii	**3**	*Ranunculus muricatus* (Sharp Buttercup)	
Melaleuca viminea		*Phalaris aquatica* (Canary Grass)	2%
Pericalymma elipticum		*Solanum nigrum* (Blackberry Nightshade)	
Patersonia occidentalis			
Viminaria juncea			
Xylomelum occidentalis			

Other Species / Natural Recruitment of Natives	Stem Count	Average Health of Revegetation	
Unknown		0 - Dead Shrub	
Juncus subsecundus		1 - Surviving but very unhealthy / unlikely to survive	
		2 - Leaf die off / yellowing clearly visible throughout	
		3 - Leaf die off / yellowing present but not abundant	
		4 - Healthy plant	
		5 - Healthy plant with signs of positive growth	5
		Other Observations	
		Weed Cover (%)	95%
		Herbivory signs - insect / animal	No
		Dieback signs (Canopy loss/Proteacea sp. loss etc.)	No
		Photo from NW corner of Quadrat	Yes
		Quadrat Summary	
		Overstorey stems / hectare	**0**
		Black Cockatoo habitat species stems / hectare	**0**
		Understorey stems / hectare	**3600**
		Total stems / hectare	**3600**
		Native species richness	**3**

Comments

19/1/23 : All annual weeds noted are dead, couch and pennyroyal surviving (neither very healthy)

26/9/23 : Large infestation of Cape Weed not noted in last annual monitoring

26/9/23 : Annual weeds not yet dead, though high in cover are unlikely to impact seedlings

Doral Stratham Offset Revegetation Monitoring Quadrat 3

Spring 2023 (To be compiled annually)

Project Name: P188 Doral Yalyalup - Stratham Offset	**Table Key:**	Species Present	
Quadrat Size: 5 m x 5 m		Overstorey Species	^
Date: 26/9/23		Black Cockatoo Habitat Species	
GPS Coordinates: 50s 372008 mE 6295408 mS		DRF / Priority Species	

Landform and Soil Description: Flat, scalped and mounded (300mm) ground, grey sandy loam with some clay. Crust on surface.

Native Species	Stem Count	Weed/Invasive Species	Cover %
Acacia saligna		*Arctotheca calendula* (Cape Weed)	
Agonis flexuosa		*Avena fatua* (Wild Oats)	30%
Allocasuarina humilis		*Briza minor* (Lesser Quarking-Grass)	20%
^Allocasuarina fraseriana		*Chenpodium pumilio* (Goosefoot)	
^Banksia attentuata		*Cynodon dactylon* (Couch)	
^Banksia grandis		*Ehrharta longiflora* (Annual Veldt)	
^Corymbia calophylla		*Isolepis cyperoides*	
^Eucalyptus marginata		*Lolium rigidum* (Annual Ryegrass)	20%
^Eucalyptus rudis	**1**	*Lotus angustissimus* (Narrowleaf Trefoil)	5%
Kunzea micrantha	**4**	*Lythrum hyssopifolia* (Lesser Loosestrife)	
Melaleuca incana		*Mentha pulegium* (Pennyroyal)	
Melaleuca osullivanii	**2**	*Ranunculus muricatus* (Sharp Buttercup)	5%
Melaleuca viminea	**2**	*Phalaris aquatica* (Canary Grass)	
Pericalymma elipticum		*Solanum nigrum* (Blackberry Nightshade)	
Patersonia occidentalis			
Viminaria juncea	**3**		
Xylomelum occidentalis			

Other Species / Natural Recruitment of Natives	Stem Count	Average Health of Revegetation	
Unknown		0 - Dead Shrub	
Juncus subsecundus	**1**	1 - Surviving but very unhealthy / unlikely to survive	
		2 - Leaf die off / yellowing clearly visible throughout	
		3 - Leaf die off / yellowing present but not abundant	
		4 - Healthy plant	
		5 - Healthy plant with signs of positive growth	5
		Other Observations	
		Weed Cover (%)	80%
		Herbivory signs - insect / animal	Yes
		Dieback signs (Canopy loss/Proteacea sp. loss etc.)	No
		Photo from NW corner of Quadrat	Yes
		Quadrat Summary	
		Overstorey stems / hectare	**400**
		Black Cockatoo habitat species stems / hectare	**400**
		Understorey stems / hectare	**5200**
		Total stems / hectare	**5600**
		Native species richness	**6**

Comments

19/1/23 : All annual weeds noted are dead, forming good cover for topsoil protection

19/1/23 : Snapped Viminaria juncea stems - animal?

19/1/23 : Dead Pericallymma elipticum

19/1/23 : Bug damage on one Melaleuca viminea

19/1/23 : Surrounding remnant marri suffering from canker

26/9/23 : ~ 12 "Spring beatles" observed on Melaleuca viminea that was observed to be bug damaged last monitoring event. Seedling has continued to grow since last observation so not a concerning observation. bug damage on other natives in quadrat also.

26/9/23 : Annual weeds not yet dead, though high in cover are unlikely to impact seedlings

Doral Stratham Offset Revegetation Monitoring Quadrat 4

Spring 2023 (To be compiled annually)

Project Name: P188 Doral Yalyalup - Stratham Offset	**Table Key:**	Species Present	
Quadrat Size: 5 m x 5 m		Overstorey Species	^
Date: 26/9/23		Black Cockatoo Habitat Species	
GPS Coordinates: 50s 371928 mE 6295403 mS		DRF / Priority Species	

Landform and Soil Description: Flat, scalped and mounded (300mm) ground, grey sandy loam with heavy clay. Crust on surface.

Native Species	Stem Count	Weed/Invasive Species	Cover %
Acacia saligna		*Arctotheca calendula* (Cape Weed)	40%
Agonis flexuosa		*Avena fatua* (Wild Oats)	
Allocasuarina humilis		*Briza minor* (Lesser Quarking-Grass)	20%
^Allocasuarina fraseriana		*Chenpodium pumilio* (Goosefoot)	
^Banksia attentuata		*Cynodon dactylon* (Couch)	
^Banksia grandis		*Ehrharta longiflora* (Annual Veldt)	1%
^Corymbia calophylla	2	*Isolepis cyperoides*	
^Eucalyptus marginata		*Lolium rigidum* (Annual Ryegrass)	25%
^Eucalyptus rudis	2	*Lotus angustissimus* (Narrowleaf Trefoil)	
Kunzea micrantha	1	*Lythrum hyssopifolia* (Lesser Loosestrife)	
Melaleuca incana		*Mentha pulegium* (Pennyroyal)	
Melaleuca osullivanii	3	*Ranunculus muricatus* (Sharp Buttercup)	
Melaleuca viminea	1	*Phalaris aquatica* (Canary Grass)	10%
Pericalymma elipticum		*Solanum nigrum* (Blackberry Nightshade)	
Patersonia occidentalis	1		
Viminaria juncea			
Xylomelum occidentalis			

Other Species / Natural Recruitment of Natives	Stem Count	Average Health of Revegetation	
Unknown		0 - Dead Shrub	
Juncus subsecundus		1 - Surviving but very unhealthy / unlikely to survive	
		2 - Leaf die off / yellowing clearly visible throughout	
		3 - Leaf die off / yellowing present but not abundant	
		4 - Healthy plant	
		5 - Healthy plant with signs of positive growth	5
		Other Observations	
		Weed Cover (%)	96%
		Herbivory signs - insect / animal	No
		Dieback signs (Canopy loss/Proteacea sp. loss etc.)	No
		Photo from NW corner of Quadrat	Yes
		Quadrat Summary	
		Overstorey stems / hectare	**1600**
		Black Cockatoo habitat species stems / hectare	**1600**
		Understorey stems / hectare	**4000**
		Total stems / hectare	**5600**
		Native species richness	**6**

Comments

19/1/23 : All annual weeds noted are dead, forming good cover for topsoil protection

19/1/23 : Much heavier clay content here than any other areas on site

19/1/23 : Stand of Melaleuca viminea to north of quadrat looking in poor health. Tall thicket has been thinned and become increasingly susceptible to wind - population likely to be lost unless natural recruitment occurs from topsoil or revegetation seed set. Eucalyptus rudis germinating throughout stand

26/9/23 : Melaleuca viminea stand flowering profusely

26/9/23 : Annual weeds not yet dead, though high in cover are unlikely to impact seedlings

Doral Stratham Offset Revegetation Monitoring

Quadrat Summary - Spring 2023 (To be compiled annually)

Average Health of Revegetation	5
0 - Dead Shrub	
1 - Surviving but very unhealthy / unlikely to survive	
2 - Leaf die off / yellowing clearly visible throughout	
3 - Leaf die off / yellowing present but not abundant	
4 - Healthy plant	
5 - Healthy plant with signs of positive growth	5
Other Observations	
Weed Cover (%)	92%
Herbivory signs - insect / animal	Yes - Quadrat 3 bug damage
Dieback signs (Canopy loss/Proteacea sp. loss etc.)	No
Average Quadrat Summary	
Overstorey stems / hectare	**800**
Black Cockatoo habitat species stems / hectare	**800**
Understorey stems / hectare	**3900**
Total stems / hectare	**4700**
Native species richness	**4.75**

APPENDIX G

Yalyalup Annual Monitoring Report 2023

Doral Yalyalup
McGibbon Track TEC Extension
2023 Annual Report
Revegetation Monitoring

January 2024

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Cover Photo: Ben Miro, Spring 2023

Version	Prepared By	Approved for Issue	Issue Date
1.0	Ben Miro	Dr. K. Locke / Brook Devine	10/01/2024
2.0	Ben Miro	Dr. K. Locke / Brook Devine	12/01/2024

Table of Contents

1. Introduction

In September 2022 Cape Life undertook revegetation of a 3.83 hectare degraded site adjacent to the locally significant remnant vegetation of the McGibbon Track. The revegetation was undertaken in accordance with the revegetation management plan (DMS-YAL-6.1) (Cape Life 2021) which was prepared as part of a clearing permit for the Yalyalup Mineral Sands Project.

'In September 2022 Cape Life undertook revegetation of a 3.83 hectare degraded site adjacent to the locally significant remnant vegetation of the McGibbon Track. The revegetation was undertaken in accordance with the revegetation management plan (DMS-YAL-6.1) (Cape Life 2021) to counterbalance direct impacts from clearing 2.72ha of degraded to completely degraded vegetation for the Yalyalup Mineral Sands Project.

This report will summarise findings from the first 3 monitoring events conducted in spring 2022, autumn 2023 and spring 2023 and is the first annual report to be compiled to date. The aim of the report is to assist in understanding the progression and success of the revegetation project in relation to the closure criteria set out in in Section 4.3 of the revegetation plan while also providing baseline data for comparison in future assessments and works.

1.1 Revegetation Objectives

The aim of the revegetation program complies with the following key requirements set by the Department of Agriculture, Water and the Environment (DAWE):

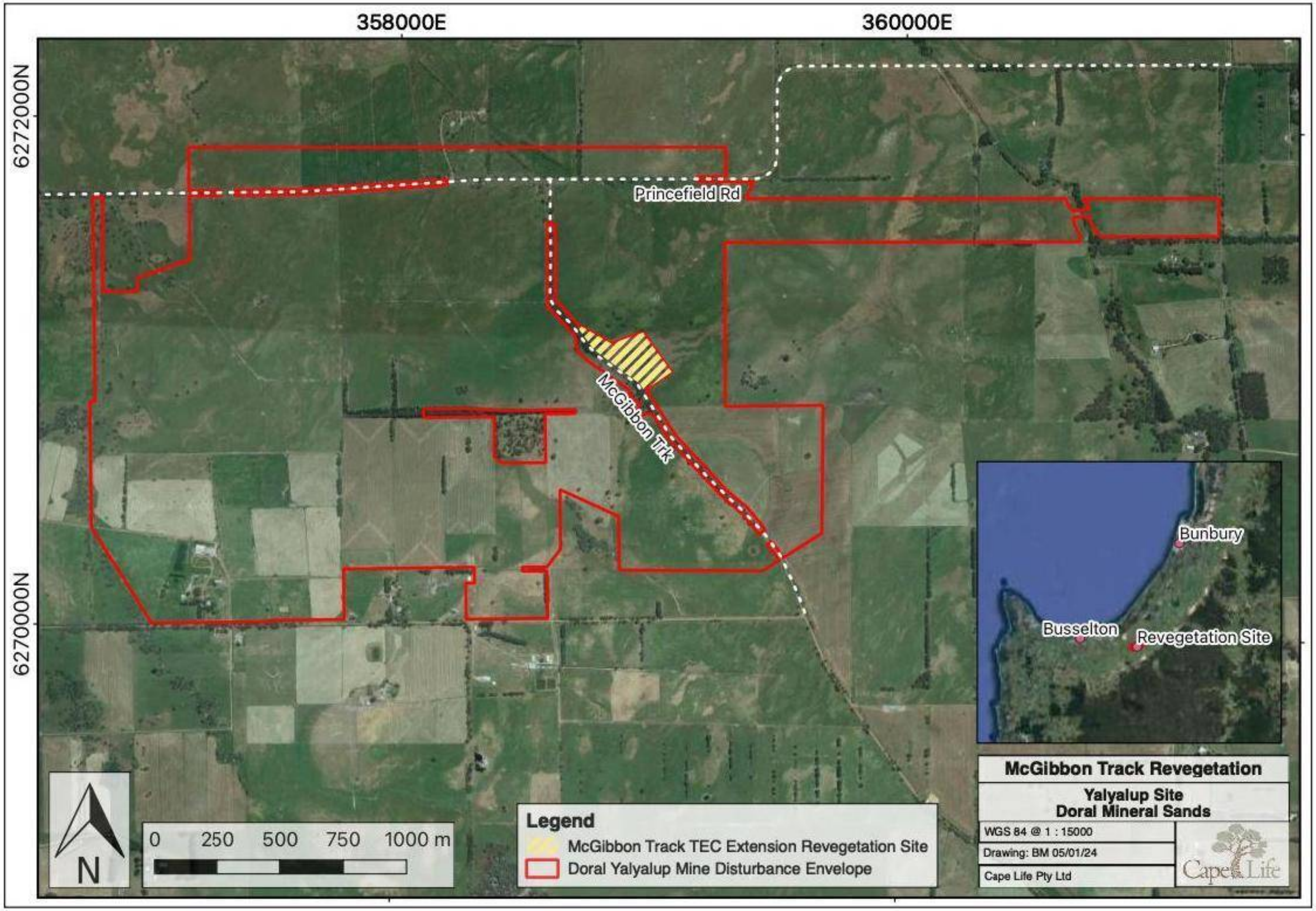
- Planting of species suitable as habitat for *Pseudocheirus occidentalis* (Western Ringtail Possum), *Calyptorhynchus Latirostris* (Carnaby's Black Cockatoo), *Calyptorhynchus baudinii* (Baudin's Black Cockatoo) and *Calyptorhychus banksia naso* (Forest Red-tailed Black Cockatoo).
- Planting of species suitable for the establishment of woodland comprised of *Corymbia calophylla* (Marri), *Eucalyptus marginata* (Jarrah) and *Agonis flexuosa* (Peppermint tree).
- Planting of understorey species with local provenance at optimal time, with a focus on using species present in the adjacent vegetation community (SWAFCT10b).
- The capacity of the site to become sustainable with minimal management whilst working towards becoming self-sustaining once established.

2. Site Description

2.1 Site Location, Ownership, Vesting and Zoning

Located within the City of Busselton, the McGibbon Track revegetation site is situated 11 km southeast of Busselton (See figure 1 below), owned by Doral Mineral Sands Pty Ltd, and zoned Agriculture under the city's Local Planning Scheme (City of Busselton 2015).

Figure 1: Revegetation Site Location



2.2 Physical and Biological Features

The local area is part of the Swan Coastal Plain landform, specifically on the Abba Plains land system (213Ab) (Ecoedge 2020a). The Abba Plain is typically represented by a level to gently undulating topography, approximately 10-40 m above sea level and contains extensive areas of poor drainage (Tille and Lantzke, 1990). The soil type is identified as sandy gradational grey-brown (Busselton) soil with some red-brown sands and loams (Tille and Lantzke, 1990). The surrounding vegetation is classified as the Abba Vegetation Complex, represented on site by mature *Corymbia calophylla* (Marri) trees surrounding a *Eucalyptus rudis* (Flooded Gum) woodland (Webb et al., 2016),

The McGibbon Track adjacent to the western boundary of the revegetation site contains the vegetation community SWAFCT10b, which is described as “shrublands on the southern Swan Coastal Plain Ironstones (Busselton area)” and is represented in good condition. “Busselton Ironstones” are listed as Critically Endangered by the Department of Parks and Wildlife and Endangered under the Environment Protection and Biodiversity Conservation Act (1999) (Ecoedge 2020a).

The revegetation site was mapped by Ecoedge as woodland of *Eucalyptus rudis* and (in some areas) *Melaleuca rhaphiophylla* over weeds on massive ironstone, and described as “Severely degraded form of SWAFCT10b - Shrublands on southern Swan Coastal Plain Ironstones (Busselton area) recognisable only by the presence of massive ironstone and lateritic boulders at or near surface.” (Ecoedge 2020a).

Due to the previous land use of grazing, pasture weeds entirely dominate the understorey vegetation of the proposed revegetation site.

2.3 Disturbances, Threats and Other Site Conditions

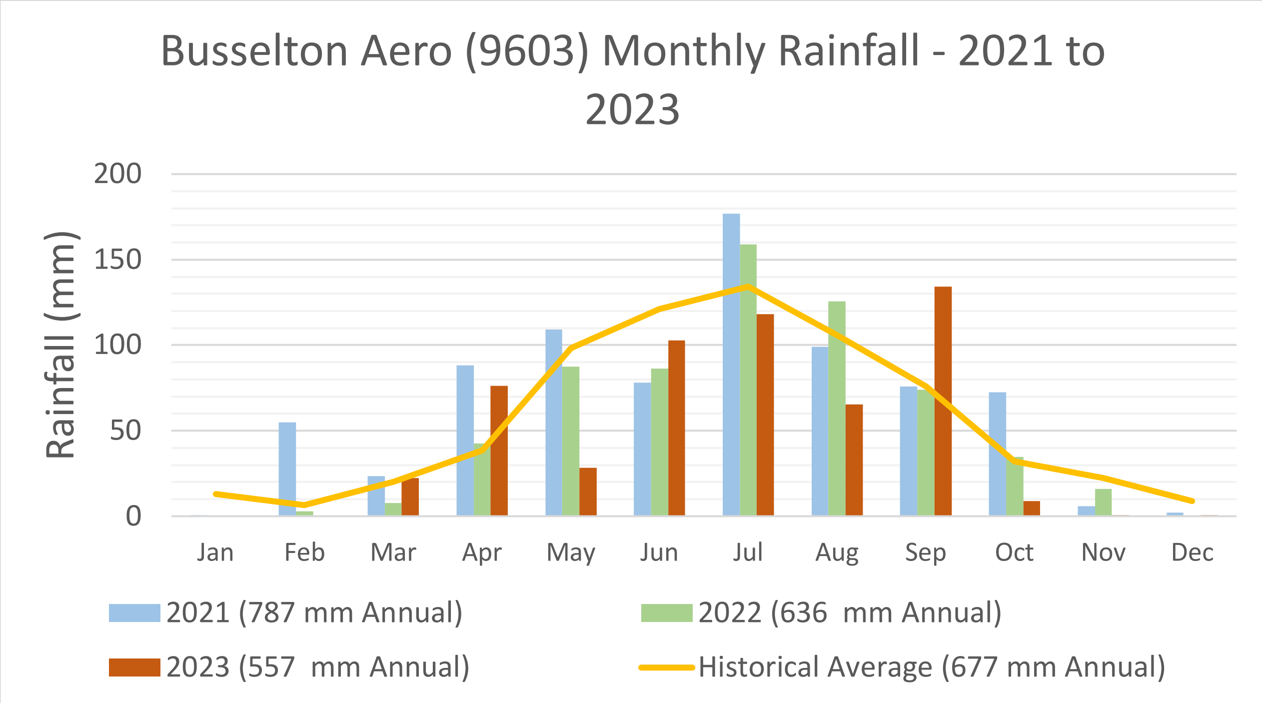
Weed encroachment, changing groundwater levels, pests and diseases are the main considerations associated with the successful establishment of self-sustaining, native vegetation at the site.

The Groundwater Dependent Ecosystem (GDE) Assessment (Ecoedge 2020b) indicates that the vegetation community SWAFCT10b is considered to be a GDE and subject to shallow seasonal freshwater inundation due to the impermeable ironstone surface outcrops and heavy soils. Appropriate timing of revegetation and application of a suitable methodology to counterbalance de-watering from mining activities will help ensure the project objectives are met.

2.4 Climate

Average (mean) rainfall for the local area is 677 mm a year with most rain falling between May and September (Station 9603 – Busselton Aero). Rainfall throughout the project’s history has accumulated under the annual average by -41 mm in 2022 and -120 mm in 2023. A graph outlining the monthly rainfall between 2021 and 2023 against the monthly historical averages is provided in Figure 2 below.

Figure 2: Monthly and Mean Rainfall Data

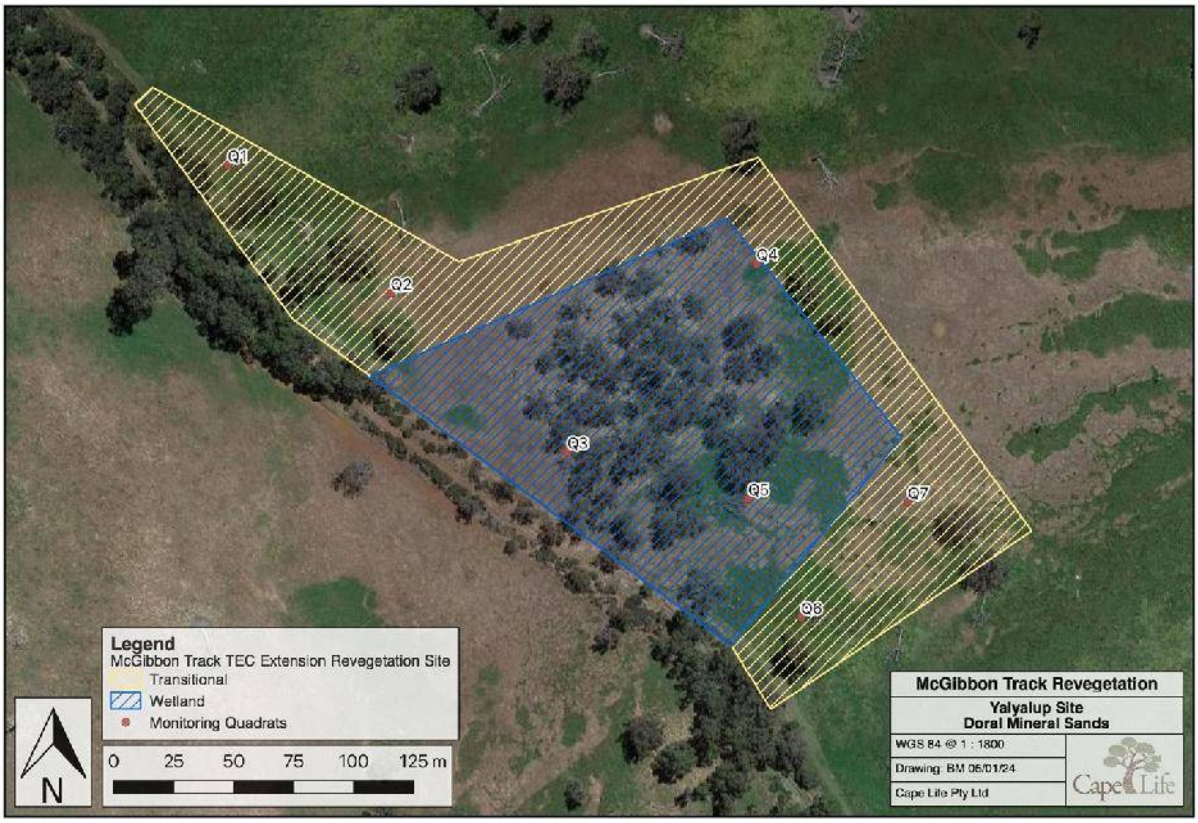


3. Revegetation Works

3.1 Site Layout

The 3.83 ha revegetation site is separated into two zones in order to achieve the project objectives (Figure 3). The wetland zone (1.96 ha) includes suitable species that represent SWAFCT10b with a focus on those tolerating potential water inundation. The transitional zone (1.87 ha) is represented by suitable habitat species for threatened fauna with a focus on establishing a sustainable woodland comprised of *Corymbia calophylla* (Marri), *Agonis flexuosa* (Peppermint Tree), and *Eucalyptus marginata* (Jarrah).

Figure 3: Revegetation Site Layout



3.2 Provenance Seed & Cuttings Collection

Seed collection was conducted in the summer of 2020/21 and summer of 2021/22 for direct seeding and seedling propagation and was acquired from stands of remnant vegetation in as close proximity to the project site as possible, at a maximum range of <20 km. 17.4 kg of native seed across 35 different species (not including cutting material species) was collected based upon historical local flora surveys (Ecoedge 2020a) and those considered suitable habitat/foraging species for threatened native fauna (see appendix for collection records). Recalcitrant species that do not germinate readily from seed or are difficult to collect in large quantities were the focus of propagation utilising cuttings or from tissue culture. Seed was processed at Cape Life's RIAWA (Revegetation Industry Association of Western Australia) accredited facility to A Grade standard under RIAWA guidelines. Prior to seeding, pre-treatments of the processed seed were undertaken according to species requirements such as smoke, hot water, or heat.

3.3 Site Preparation

Prior to ground works, weed control was undertaken during autumn and winter to reduce the burden of weeds. A 1.8 metre high exclusion fence was installed with a rabbit skirt, kangaroo gates, vehicle access gates and a dieback clean on entry point to mitigate the risk of predation by grazing mammals and to secure the site. Prior to direct seeding, the site was ripped using shallow tines to alleviate soil compaction, promote root development and increase the surface capacity for retaining seed. Ripping did not occur under mature trees (largely in the central part of the site) or in areas with exposed rock.

3.4 Seeding and Planting – Initial Installation 2022

Seeding and planting was undertaken in September 2022 after water-inundation of the revegetation was observed to have subsided. Seed was assigned to wetland or transitional species mixes, batched homogenously with sterile sand and mycorrhizal inoculant (MycoApply) prior to seeding. The seed mix was then divided into approximately 8 bags per hectare. Bags were assigned to different areas to allow for an even distribution of seed across the site and broadcast by hand at a rate of 4.37 kilograms per hectare.

A total of 9075 seedlings batched into wetland and transitional species mixes were installed after seeding was completed. Seedlings were supplied by Nuts about Natives and Boyanup Botanical in a combination of cell trays and tubes grown from provenance collected seed or cuttings material.

In both the wetland and transitional zone, understorey seedlings were installed at a density of 1/5 m2. Tree species were installed at a rate of 1/20 m2 in the transitional zone and a lower rate (due to existing *Eucalyptus rudis)* of 1/40 m2 in the wetland zone. The actual density of planting was likely higher due to shallow or exposed ironstone decreasing the planting area. Seedlings were planted with a Pottiputki where surface preparation was possible and with hand augers to break surface compaction in areas where surface preparation was not practical (e.g. areas with remnant *Eucalyptus rudis* in the wetland zone).

3.5 Remediation Planting

As originally forecast, remediation planting was undertaken in spring of 2023, where approximately 20% (1890 seedlings) of the original seedling allocation were installed as a contingency measure to any losses or gaps in revegetation. Fortunately, there was no major losses or gaps in vegetation (other than shallow/exposed ironstone areas impracticable of revegetation) and infill planting was solely concentrated in areas where the higher weed-burden had reduced direct seeding establishment. Chemical weed control, slashing and infill planting in 2023 was targeted in these high-weed burden areas (see photo – Appendix 9).

10% of the original seedling quantity was planned for remediation planting in 2024 as specified in the revegetation management plan but has been deemed unnecessary based upon 2023 monitoring and planting works.

3.6 Ongoing Works & Maintenance

Regular inspections of the McGibbon Track revegetation site by Doral's environmental team are undertaken to ensure site stability and to help prioritise management actions. Inspections focus on fence structure, site stability, topsoil health, vegetation health, evidence of herbivory, pathogens and invasive weed species. These inspections complement the bi-annual revegetation monitoring program.

Chemical weed control and slashing has been undertaken where required to reduce the burden of invasive species and keep firebreak/maintenance tracks clear, but has been minimal and is expected to be even less frequent as vegetation establishes.

A one-off watering event focusing on planted seedlings has been undertaken in January 2024 with soluble organic fertiliser and liquid soil wetter. This was deemed necessary due to the low annual rainfall of 2023 and unusually large period of time since the last significant rainfall event (mid-September 2023).

4. Monitoring

4.1 Methodology

A 5-year monitoring program was established to track progress against the vegetation component of the closure criteria set out in Section 4.3 of the Revegetation Management Plan. The monitoring program consists of bi-annual monitoring events conducted in autumn and spring each year.

Monitoring quadrats were set up in accordance with the standard procedures set out in EPA Guidance Statement 6 (EPA, 2016). 7 Permanent 5 x 5 m quadrats (Figure 3) were positioned using a stratified random method across the revegetation site, at approximately 1.83 quadrats per hectare.

In spring 2022 (22/11/22) a baseline monitoring event was undertaken shortly after installation, and in 2023 the two monitoring events were conducted during autumn (4/4/23) and spring (14/11/23). Information was recorded in the field using Cape Life field monitoring data sheets modified to include the specific metrics outlined within the Revegetation Management Plan. A photo was taken at the NW corner of each site and the location recorded with a Garmin GPS. Relevant observations were also recorded opportunistically across the site.

The following parameters were recorded for each quadrat:

- Quantitative native species list within the 5 x 5 m quadrat
- Qualitative non-native species list with % cover
- Average health of revegetation including signs of herbivory or dieback
- Overstorey/understorey and total stems per hectare
- Black cockatoo habitat species stems per hectare
- Assessment of species richness
- General observations

4.2 Closure Criteria

As outlined within the Revegetation Management Plan (Cape Life 2021) the observations recorded during monitoring will be assessed against the following closure criteria which were developed based upon the DAWE objectives listed in section 1.1 of this report.

- Erection of a suitable perimeter fence to be installed to provide an effective barrier to prevent or reduce impacts to the revegetation area
- The mix of species is comprised of species recruited from direct seeding and species introduced as tube stock grown from seed, cuttings or whole plants salvaged from within 20 km of the revegetation site.
- Within 5 years:
    - A total surviving tree count of 250 overstorey woodland species (comprising at least 100 Marri, 100 Jarrah and 50 Peppermint trees).
    - Understorey species richness is at least 50% of adjacent SWAFCT10b richness and density at least 1000 stems/ha

- Weed cover is no greater than 60% of the current weed cover within adjacent SWAFCT10b (currently 80-100%), with no Declared weeds present within the revegetation area.
- No dieback is present within the revegetation area.

4.3 Limitations

This annual report has been compiled based on monitoring events since 2022, with a focus on the first year of revegetation. Some species occurring from natural recruitment, or the topsoil seed bank may not have been formally identified. Predicted outcomes of closure criteria in the discussion and recommendations in this report rely on likelihood revegetation trends continuing but are subject to natural variability (such as rainfall or bushfire). Due to these limitations, the interpretation of the results and their relation to closure criteria may differ.

5 Results

Table 1: Revegetation Performance Against Completion Criteria Set in Revegetation Management Plan (Cape Life 2021).

Closure Outcome	Completion Criteria	Measurement	2023 Observations	2023 Comments
Exclusion of grazing stock and feral animals to secure revegetation success.	Erection of suitable perimeter fence to be installed and provide an effective barrier to prevent or reduce impacts to revegetation area.	Observed installation and maintenance of perimeter fence.	Perimeter fence, gates and kangaroo gates all in-tact and functional.	N/A
Plants used in rehabilitation to be of local provenance.	The mix of species is comprised of species recruited from direct seeding and species introduced as tube stock grown from seed, cuttings or whole plants salvaged from within 20 km of the revegetation site.	Audit of rehabilitation records for sources of plant materials used in rehabilitation.	All material used to propagate seedlings or direct seed for revegetation at McGibbon Track TEC Extension site has been sourced within 20 km of site.	N/A
Overstorey vegetation is self-sustaining and suitable for future use by three species of Black Cockatoos and Western Ringtail Possums.	Within 5 years a total surviving tree count of 250 overstorey woodland species (comprising at least 100 Marri, 100 Jarrah and 50 Peppermint trees).	Visual inspection (Tree count).	Mean of 171 stems/ha across monitoring quadrats. Therefore, an estimated 650 habitat overstorey species currently on site.	Observations are higher than completion criteria but during early stage of revegetation high stem/ha counts are commonly recorded. Stems/ha of all species are expected to thin naturally over time. This metric will increase in importance as the revegetation progresses.
Understorey composition is similar to the adjacent vegetation community (SWAFCT10b).	Within 5 years: Species richness is at least 50% of adjacent SWAFCT10b richness. Understorey density is at least 1,000 stems/ha.	Quadrats & Random Meander.	Mean species richness of 7 species across monitoring quadrats. Total species richness on site is 34 species.	Flora surveys for SWAFCT10b have been by different methodology (i.e. Level 1 Flora Survey of wider vicinity) and therefore species richness measurements by quadrat average are not exactly comparable. Number of vascular flora found within the vicinity of the ironstone vegetation

Closure Outcome	Completion Criteria	Measurement	2023 Observations	2023 Comments
			Understorey density is at 5943 stems/ha.	on McGibbon Track prior to 2007 is 67 native species. (Ecoedge 2020a) Understorey density well above target.
Reduced weed cover in comparison to the adjacent vegetation community (SWAFCT10b).	Within 5 years: Weed cover is no greater than 60% of the current weed cover within adjacent SWAFCT10b (currently 80-100%). No Declared weeds are present within the revegetation area.	Quadrats	Mean Weed Cover across Quadrats is 66%. No declared weeds present within the revegetation area.	As current weed cover of SWAFCT10b is 80-100%, the weed cover completion criteria cannot be greater than 60% and therefore weed cover metric is likely to be achieved. Weed coverage within revegetation varies greatly between seasons as annual ryegrass from previous agricultural land use dominates in winter but dies-off in summer. No declared weeds present though weed control for other pest species is ongoing with ~ 5 *Zantedeschia aethiopica* individuals treated in spring 2023.
Dieback	No dieback is present within the revegetation area at 5 years post establishment.	Dieback survey	No signs of dieback within revegetation area.	Dieback signs are likely to become more pronounced with revegetation maturity. Proteaceae loss, reduced canopy health of mature overstorey species and signs of dieback in nearby remnant vegetation will continue to be monitored for. 5 years after revegetation is considered an appropriate time for formal dieback assessment.

6 Discussion

This document is the first annual report within the 5-year monitoring plan and summarises the first three monitoring events conducted from spring 2022 through to spring 2023. The data summaries within the report provides a record of works undertaken and assists in establishing future trends against the fulfillment of closure criteria. Assessment of the McGibbon Track Revegetation will become more robust with each successive year of reporting, although will be subject to some limitations as detailed in section 4.3 of this report.

The general trend of the revegetation is positive with all metrics trending towards closure criteria. Monitoring photos in Appendix 7 and 8 are taken from the northwest corner of Quadrat 1 in spring 2022 and spring 2023 which give a visual understanding of the change typically seen across the site, whilst the cover photo shows an area of site that is performing better than average.

The major factor influencing revegetation within the site is the presence of massive ironstone and lateritic boulders at or near the surface. Areas where these boulders are near the surface are generally correlated to poorer germination and seedling establishment (appendix 9 shows patches where vegetation is successful and not successful, due to these boulders). The central area of the site considered 'wetland' type vegetation (see map in figure 3) is most affected, attributing to its seasonal inundation and generally has less successful revegetation establishment. In contrast, revegetation in the 'transitional' areas has generally been more successful.

Within the transitional areas, the secondary factor influencing revegetation establishment has been weed competition, where areas of fertile soil have had higher weed burden competing with native germinants. There are three main areas (far northwest, northeast and south) that had high weed competition, and from the map in figure 3 can be quite distinctly attributed to the greener shades within the aerial photo. Chemical weed control, slashing and infill planting in 2023 was targeted in these areas as they are most suitable for seedling establishment after weed competition was managed. It is expected that over time perennial vegetation establishing over surface boulders will perish due to lack of available soil affecting root growth and health.

Mining for the Yalyalup mineral sands project is continuing in surrounding areas and dewatering may have an ongoing influence on revegetation, as the SWAFCT10b areas of revegetation and McGibbon Track are classed as a groundwater dependent ecosystem (Ecoedge 2020b). The remnant vegetation on the adjacent McGibbon track is currently being managed for ground water availability with different methodologies being implemented to ensure groundwater depths are kept at acceptable levels. Onflow effects have not yet been observed to have impacted the vegetation of the revegetation site but may have been a contributing factor to the lack of inundation observed within the 'wetland' area in winter 2023, whilst in the 2022 winter prior to nearby dewatering there was significant inundation. It is important to note that 2023's annual rainfall was well under the seasonal average (see figure 2) which may also have affected lack of inundation. As the effects of groundwater level change are initially incremental (Ecoedge 2020b), onflow effects within the revegetation site will be monitored into the future. As a result of low rainfall and groundwater changes, the seedlings installed in 2023 were watered with soluble organic fertiliser and liquid soil wetter in January 2024.

It is expected that the closure outcome 'Exclusion of grazing stock and feral animals to secure revegetation success' is maintained and achieved. There have been no observed faults in the perimeter fence or gates since installation and monitoring of perimeter integrity is frequently inspected by Doral personnel. Although there have been some suspected signs of rabbit herbivory, there has been no definitive observations and there has been no significant impact on revegetation.

The closure outcome specifying 'Plants used in rehabilitation to be of local provenance' is assured as the species recruited from direct seeding planted by seedlings grown from seed, cuttings have been collected from within 20 km of the revegetation site prior to revegetation. All collections were managed by Cape Life, and strict management of provenance was implemented throughout the collection process.

The overstorey completion criteria targets is for the total surviving tree count within 5 years is required to be 250 overstorey woodland species (*Corymbia calophylla, Eucalyptus marginata and Agonis flexuosa)* that can provide habitat for the conservation significant Black-Cockatoos and Western Ringtail Possums. Observations are currently higher than completion criteria with an estimated 650 stems currently on site. During the early stage of revegetation high stems/ha counts are commonly recorded due to the initial flush of germinants in direct seeding. Although the number of trees expected to reach self-sustaining maturity is uncertain due to natural thinning and fluctuations in environmental conditions, observations represent a positive indicator in achieving the closure criteria targets.

Selection of understorey species for revegetation has been based upon historical local flora surveys to achieve an understorey composition similar to the adjacent good quality vegetation of the SWAFCT10b vegetation community within the McGibbon Track. Although the completion criteria for the species richness closure outcome is set at 'species richness of at least 50% of adjacent SWAFCT10b richness', the exact data to directly measure against is not yet known.

Historical flora surveys for SWAFCT10b have been undertaken by level 1 flora survey, and are for the wider vicinity of the ironstone vegetation on McGibbon Track (Ecoedge 2020a). As the level 1 flora survey was for a wider scope of area than just SWAFCT10b, the actual species richness within SWAFCT10b can be assumed to be less than the 67 different vascular species listed within the level 1 survey. The most recent monitoring event has shown a mean species richness of 7 species across monitoring quadrats and a total species richness across the site of 34 species, therefore achieving above the >50% completion criteria, at a minimum. Additionally, the survival of most species selected for revegetation is positive sign of revegetation success and the stems/ha count for understorey species is currently well above the <1000 stems/ha target at 5943 stems/ha.

Weed cover closure outcome is highly likely to be achieved as current weed cover of SWAFCT10b is 80-100% and completion criteria require 'no greater than 60% of the current weed cover within adjacent SWAFCT10b'. The completion criteria also states that no declared weeds are present within the revegetation area, and throughout the revegetation program none have been observed. Weed coverage within revegetation varies greatly between seasons as annual ryegrass from previous agricultural land use dominated in winter but dies off in summer. Weed control has been undertaken throughout the revegetation program, mainly to reduce impacts of Blackberry Nightshade (*Solanum nigrum)* Fleabane (*Erigeron bonariensis)* and Afghan Melon *(Cucumis myriocarpus)*. Approximately 5 individuals of the Arum Lily *(Zantedeschia aethiopica)* have also been treated. The impacts of weeds have been mentioned earlier in this discussion as a main factor influencing revegetation in the transitional areas but are being managed successfully through chemical weed control, slashing and infill planting.

Completion criteria requires that 'No dieback is present within the revegetation area at 5 years post establishment'. Although there have been no observations, dieback signs are likely to become more pronounced with revegetation maturity. Proteaceae loss, reduced canopy health of mature overstorey species and signs of dieback in nearby remnant vegetation will continue to be monitored for. 5 years after revegetation is considered an appropriate time for formal dieback assessment.

The McGibbon Track Revegetation site is showing positive signs in its capacity to become sustainable with minimal management and self-sustaining once established, but will continue to require further monitoring and management as the revegetation matures.

7 Recommendations

Based on this monitoring report, the following are recommendations for continuing the program towards achieving the McGibbon Track Revegetation closure criteria:

- Seedling installation has been deemed unnecessary for 2024 but provenance seed stocks are still recommended to be held as a contingency measure in the future.
- Continue to monitor conditions such as fence structure, site stability, topsoil health, vegetation health, absence of herbivory, pathogens and invasive weed species etc. and action upon when necessary.
- Continue to monitor groundwater management actions.
- Vehicle and machinery movement should be minimised, and hygiene should be maintained prior to accessing the site to ensure no new weed or Dieback (Phytophthora sp.) infestations are introduced.
- Maintain a Bushfire Management Plan for the site.

8 References

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9 Appendix

Appendix 1 - Seed Collection Record

Doral Yalyalup 2020/21/22 Collection Record

Transitional Species	Weight (g)
Acacia extensa	924
Acacia pulchella	609
Acacia saligna	145
Acacia saligna	1014
Agonis flexuosa	117
Agonis flexuosa	129
Allocasuarina fraseriana	44
Allocasuarina fraseriana	238
Allocasuarina humilis	269
Banksia attenuata	161
Banksia attenuata	474
Banksia grandis	925
Corymbia calophylla	501
Eucalyptus marginata	166
Eucalyptus marginata	592
Hakea prostrata	29
Hypocalymma robustum	14
Jacksonia furcellata	111
Kennedia coccinea	40
Kennedia coccinea	738
Melaleuca osullivanii	345
Patersonia occidentalis	40
Xanthorrhoea preissii	625
Xylomelum occidentale	397
Total	**8647**

Wet Species	Weight (g)
Banksia littoralis	26
Callistachys lanceolata	103
Calothamnus quadrifidus subsp. teretifolius	37
Eucalyptus rudis	1489
Hakea ceratophylla	24
Hakea varia	10
Hypocalymma angustifolium	1
Juncus pallidus	537
Kunzea micrantha	1312
Melaleuca incana	1477
Melaleuca osullivanii	346
Melaleuca preissiana	153
Melaleuca rhaphiophylla	319
Melaleuca viminea	1547
Pericalymma elipticum	74
Regelia ciliata	65
Viminaria juncea	717
Viminaria juncea	548
Total	**8785**

Overall Total	**17432**

Appendix 2 – 2022 Planting List

Doral Yalyalup 2022 Planting List

Transitional Species	Seedlings
Understory	
Acacia saligna	200
Adenanthos barbiger	22
Adenanthos meisneri	589
Allocasuarina humilis	180
Hakea lissocarpha	569
Hibbertia hypericoides	270
Hibbertia racemosa	
Hibbertia subvaginata	
Hypocalymma robustum	252
Jacksonia furcellata	288
Kennedia cocciniea	216
Melaleuca osullivanii	232
Melaleuca viminea	200
Patersonia occidentalis	504
Persoonia elliptica	1
Persoonia longifolia	64
Xanthorrhoea preissii	260
Total	**3847**

Overstory	
Agonis flexuosa	150
Allocasuarina fraseriana	108
Banksia attentuata	189
Banksia grandis	189
Corymbia calophylla	216
Eucalyptus marginata	144
Xylomelum occidentalis	126
Total	**1122**

Wetland Species	Seedlings
Understory	
Acacia saligna	232
Calothamnus quadrifidus subsp. teretifolia (P4)	393
Hakea ceratophylla	423
Hakea varia	66
Hypocalymma angustifolium	30
Kunzea micrantha	327
Melaleuca incana	432
Melaleuca osullivanii	200
Melaleuca viminea	520
Pericalymma ellipticum	427
Viminaria juncea	432
Total	**3482**

Overstory	
Agonis flexuosa	210
Banksia littoralis	126
Corymbia calophylla	72
Eucalyptus rudis	216
Total	**624**

Overall Total	9075

Appendix 3 – 2023 Infill Planting List

Doral Yalyalup
2023 Infill Planting List

Species	Seedlings
Understory	
Acacia pulchella	56
Adenanthos barbiger	18
Adenanthos meisneri	16
Allocasuarina humilis	0
Astartea scoparia	72
Callistachys lanceolata	95
Calothamnus quadrifidus subsp. teretifolia (P4)	150
Hakea lissocarpha	63
Hakea prostrata	57
Hakea varia	63
Hibbertia racemosa	336
Hypocalymma angustifolium	72
Hypocalymma robustum	62
Melaleuca incana	72
Melaleuca osullivanii	72
Melaleuca viminea	72
Pericalymma ellipticum	72
Regelia cilitata	72
Total	**1420**

Overstory	
Agonis flexuosa	106
Allocasuarina fraseriana	32
Banksia grandis	63
Banksia littoralis	59
Corymbia calophylla	66
Eucalyptus rudis	72
Melaleuca preisiana	72
Total	**470**

Overall Total	**1890**

Appendix 4 – Field Monitoring Report Summary – Species Monitoring

Average Health of Revegetation	**3.14**
0 - Dead Shrub	
1 - Surviving but very unhealthy / unlikely to survive	
2 - Leaf die off / yellowing clearly visible throughout	
3 - Leaf die off / yellowing present but not abundant	**3**
4 - Healthy plant	
5 - Healthy plant with signs of positive growth	

Other Observations	
Weed Cover (%)	**66%**
Herbivory signs - insect / animal	**Yes**
Dieback signs (Canopy loss/Proteacea sp. loss etc.)	**No**

Quadrat Summary	
Overstorey stems / hectare	**800**
Black Cockatoo habitat species stems / hectare	**171**
Understorey stems / hectare	**5943**
Total stems / hectare	**6743**
Native species richness	**7**
Site total native species richness	**34**

Appendix 5 – Field Monitoring Report Summary – Vegetation Monitoring

Native Species	Present in Revegetation Area
Acacia saligna	
Acacia applanata	
Acacia extensa	
Acacia pulchella	
Adenanthos barbiger	
Adenanthos meisneri	
^ Agonis flexuosa	
Agrostocrinum hirsutum	
^ Allocasuarina fraseriana	
Allocasuarina humilis	
Astartea scoparia	
^ Banksia attentuata	
^ Banksia grandis	
^ Banksia littoralis	
Banksia squarrosa subsp. argillacea (DRF)	
Callistachys lanceolata	
Calothamnus quadrifidus subsp. teretifolia (P4)	
^ Corymbia calophylla	
Daviesii preissii	
^ Eucalyptus marginata	
^ Eucalyptus rudis	
Haemodorum spicatum	
Hakea ceratophylla	
Hakea lissocarpa	
Hakea prostrata	
Hakea varia	
Hibbertia hypericoides	
Hibbertia racemosa	
Hibbertia subvaginata	
Hypocalymma angustifolium	
Hypocalymma robustum	
Jacksonia furcellata	
Juncus pallidus	
Kennedia cocciniea	
Kunzea micrantha	
Loxycarya magna (P3)	
Melaleuca incana	
Melaleuca osullivanii	
^ Melaleuca preisiana	
^ Melaleuca raphiopylla	
Melaleuca viminea	
^ Nuytsia floribunda	
Patersonia occidentalis	
Patersonia umbrosa	
Pericalymma ellipticum	
Persoonia elliptica	
Persoonia longifolia	
Regelia ciliata	
Verticordia plumosa var. vassensis (DRF)	
Viminaria juncea	
Xanthorrhoea preissii	
^ Xylomelum occidentalis	
Total Species Richness	**34**

Appendix 6 – Field Monitoring Data Sheets

*Please see attached file included

Appendix 7 – Quadrat 1 Photo Spring 2022

Appendix 8 – Quadrat 1 Photo Spring 2023

Appendix 9 – Photo depicting slashing & 2023 infill planting (foreground) with 2022 revegetation and remnant vegetation in background

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